

# POPULAR Computing WEEKLY

## Atari plans research facility in Europe

Details on page 6

Superbase for  
the Atari ST

Communicating  
on your PCW

The rise and rise  
of computer fraud



Screen image is Pegasus software

**SPECIAL  
supplement**

### THE QL

Desktop  
publishing

Graphics





①

# SCULLO



firebird





# May 8-14

# CONTENTS

# POPULAR Computing WEEKLY

## News

- 6 News Desk** Arian to invest in R and D in Europe.  
**41 Soundcheck** Mark Jenkins reports on Microdeal's venture into musical composition, Digidrum for the ST.  
**42 Communications** All the newest news on Compaqnet for Commodore users to explore.

## Features

- 13 Computer crime** John Eldersenden looks at the growth of computer related fraud, and talks to Detective Inspector Austin of the computer crime unit attached to the fraud squad.  
**16 PCW modern** Minicall's WS4000 is now configured for the Amstrad PCs. We try it out with Segsoft's Chat Chat in support.  
**18 Superbase Personal** Now for the Arian ST, Probase's database has been completely rewritten since the days of Superbase on the 64.

## Supplement - the QL

- 20 News** There is still plenty of support for the QL. Read of some of the latest developments in the field.  
**26 Desktop publishing** The best packages from Digital Precision and TR Computers.  
**30 Graphics applications** Rubicon has brought out a CAD program, Respoint, and Eubankoff's AC3 values for mouse users.  
**32 Chairman of the boards** Digital Precision's IBM-style alternative keyboard.

## Programming

- 36 Peek and Poke** Kern Garroch answers your programming queries.  
**41 Learning C** is part two of our series. Kern Garroch takes you further into the programming language C.  
**45 Listings** This week we round up the Icon Toolkit for Amstrad CPCs, bring you the first part of Magic Mace on the BBC, and more on those Spectrum Rom calls.  
**49 Bytes and Pieces** Short routines for you to type in.

## Games

- 48 New releases** Your complete guide to all the games released this week, including retrospectives from L2L Data, Spectrum Software, and Kinestik from Probird.  
**49 It all of Fame** Gamewar's Championship Football, published by Activision, is this week's addition to the Popular Hall of Fame.



Top: Electronic musical design at the Soundcheck 4 computer software studio. Above: Soundcheck/Personal database. Arian from 100000.



**Editor** Christine Ebdon **News editor** John Eldersenden **Features editor** John Cook **Technical editor** Damian Evans **Production editor** Michelle Beckwith  
**Supplements editor** Christopher Jenkins **Supplements designer** Jonathan Hoar **Marketing and Administration Manager** Carol Owen **Advertisement Manager** Ian  
 Peadar **Editorial Assistant** Christopher Jenkins **Editorial Secretary** Anneline O'Dwyer **Credit Control Manager** Catherine Pearce **Managing editor**  
 Peter Westbrook **Publishing director** Penny Ineson **Publisher** for Southern Publications Ltd. 13-15 The Newprint Street, London EC3N 2PP. Tel 01-437 4545  
 Telex 355675 FALCON 001 **Typeset by** Magazine Typesetters, 8 Parkside Court, East Putney, London SW15 2NU. **Printed by** McCombsdale Magazine  
 Services, Hemel Hempstead. **Registered for** V at London. London 2496. Tel 01-274 8611. Telex 26 9643.  
 © Southern Publications Ltd 1987. ISSN 0950-0608

ABC

**We're copyright notices** Articles which are submitted for publication must not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is the responsibility of the copyright owner to ensure that all other magazines and submit their text - (a) please do not be tempted. We cannot guarantee to return your programs - so please do not send your only copy. **Copying** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make our programs work.

**Popular Computing Weekly. Tel: 01-437 4343.**



## In defence of the small dealer

In reply to your correspondent **D W Stratton** in the April 10 issue, I would like to offer a contrasting set of experiences. First of all I will admit to being a very basic user of the Commodore 64 and a regular reader of your magazine. This, perhaps, is what saved me from making the same mistakes he did.

Like Mr Stratton, I started the year with a resolve to upgrade to a 16-bit machine, and as there seemed to be only one at an affordable, publishable price, I also decided on the Atari 520ST.

I spoke to Silas Shep, asking what I thought were simple questions about such matters as the voltage of the power supply, if I've already had to repair the C64 PSU once, and if it's on the way out again), the frame and scan rates of the monochrome monitor, and whether the RGB output was TTL or linear. The person I spoke to didn't know. I spoke to the Atari Helpdesk. Nobody there knew either.

In desperation I spoke to a South Island London dealer, Harveys, whereupon a service manual was opened and all my questions were answered. I was also told the answers to all Mr Stratton's questions, such as just what was bundled with the machine and the prices of all the third party disc drives, etc. I was given such a good picture that I decided not to buy yet - still waiting for the Amiga/ST battle to sort itself out a bit more. If I do buy an Atari I know where from.

I suppose the moral is the old one of not the buyer beware, and let him choose a good dealer.

**F McClelland**  
London SE20

## No printer problems here

I refer to Ken Garrod's reply to **R L Penfold** in April 10 issue of Popular.

I have had experience with a number of QL and printer set-ups and can report that with Epson and compatible printers (eg, Shinwa CP80 and clones) there is generally no problem in running at 9600 baud if using the serial line. The most general problems I find arise whilst attempting to configure Quil

and the other Pison programs to run with a specific printer.

The Brother MT-200 used by Mr Frichard seems to be a different type of link, one of my friends recently purchased one and could not get it to work at all. The problem was resolved by making up a special cable which, I believe, had pins 4, 5, 6 and 8 linked together. This information should be checked with Brother, which my friend found most helpful. It could be Mr Frichard has a handshaking problem if one of these lines is not connected.

The printers I have dealt with have never required these connections to make them work and I suspect a large number of printer cables sold do not incorporate them.

**Andy Cox**  
Dorchester

## Escaping from the Organiser

With reference to the Pison Organiser program, Exchange, which you published in Popular, April 2.

The program as tested will turn an endless loop when run, which could be rather frustrating for a beginner, who may not know how to escape.

The solution is to add a Quit option to the menu on line five and tag the following line on to the end of the program, just before the ENDIF statement.

**IF UN-2 THEN**

**Mike O'Keefe**  
IPSO press

## Long live the Stone Age

I would like to present my response to **Farwell** to the cassette (Zigzag, April 11-30).

I have owned a 48K Spectrum and cassette recorder for four years, and during that time, I have only lost two cassettes - not bad for a "perfectible system".

In October last year, I decided to 'upgrade' to a disc system, after being 'enlightened' by speed, reliability, convenience, etc.

During the six weeks that followed, I had five drives, both of which were sent back twice for a total of three weeks, programs mysteriously wiped out, valid disc commands rejected, discs formatted when I tried to

save a program, and only two programs - which I saved properly.

Not surprisingly, I decided to get a refund - reliability and convenience being replaced with profitability and convenience.

Disc drives and discs may not be that expensive, but, for the Spectrum at least, they're about five times more expensive than cassette recorders and cassettes.

The ST and Amiga are in the business/super home sector of the market, so who would expect them to have a cassette interface?

Last week I bought a Spectrum 128, and unless Amstrad produces a very reliable, cheap disc upgrade for compatibility with the Plus 2, I would rather wait 15 minutes for a program to load than have a possible disc drive-style hassle.

Finally, Mr Shephard, I am not, as your article would suggest, a crazy person using a primitive clunker manufactured by a madman, but somebody who has had experience of both cassettes and discs and finds cassettes most.

**David Banks**  
Preston

## Forum for discussion

I would be grateful if you could mention a magazine on cartridge for the QL.

It is called Forum, and issue two is available by sending 50p, a stamped addressed envelope and a blank formatted cartridge to Ian R Bunker at 20 The Broadway, High Wycombe, Bucks HP12 3LP.

**Ian R Bunker**  
Sunderland

## The vanishing disc drive

The special feature on consumer rights (April 17) will have been of interest to many readers, although it gave the impression that most problems are encountered with small computer shops and mail order outlets.

My major headache concerns a high street store better known for selling aspirin than computers.

Last summer I bought a Micro Peripherals disc drive and interface for my QL. After three months of moderate use the

interface developed a fault, so I returned it to a branch of the supplier.

Over three and a half months later the unit was returned (first the interface, then the disc drive a week later) in a worse condition than when it was taken in for repair. The disc drive refused, and would no longer read my double sided discs.

The drive is now with the chain's head office. I have been without the use of it for four and a half months out of the last eight, and can still see no prospect of a refund or replacement. Surely this is totally unacceptable behaviour on the part of a national chain store?

**Michael C. Jackson**  
Barnet on Road

## The Amiga vs Atari ST debate continues

I would be grateful if you could give me some advice on the Amiga 500 vs Atari ST debate. I have £800 to spend on one of them and require stunning graphics, great sound, and a huge amount of software to choose from.

Do the ST and Amiga 500 both have these attributes? Are they both good for playing games on? Will more software be written for them (ie, the QL died because of little interest from software houses)?

**George McCusker**  
Glasgow

Both the Amiga 500 and ST have graphic capabilities far superior to those on 8-bit machines. The sound chip on the Atari ST is the AY38910; while this is the same chip as in the Amstrad 484, for example, the sound potential on the ST is greater, thanks to its MIDI connections. The Amiga contains a custom sound chip and also has the option of stereo output.

Neither machine has a huge software base as yet. While the list of software available is growing for both machines, in the UK at least, the ST is ahead in this respect at the moment.

The machines are both "good" for playing games on, though you should bear in mind that games playing is not entirely what Commodore and Atari had in mind when designing them. Should you wish to turn to more business-oriented applications



later, both will be suitable.

We believe that software companies will continue to write in ever increasing numbers for the Amiga and ST. Most major houses already include at least the ST in their plans for future releases, and when the Amiga 500 becomes available in the shops later this year, it should be gradually included as well in companies' plans.

## Repairing points

Having read your April 10 issue, I feel prompted to write regarding a couple of points.

Firstly, the item in News Desk regarding Amstrad, the BBC and the PC1612.

I run the computer department of a large high street store. We have a PC1512 with double drive and colour monitor on display.

This machine is on from 9.00am in the morning until 5.30pm (8.00pm on Thursdays) six days a week. It has never shown any sign of overheating and we have never had any problems with it (apart from when the clock batteries were flat).

All our customers who have purchased one from us have been satisfied and we have had no bad feedback from any of them.

Secondly, I would like to congratulate John Anderson (Letters, April 15). This man has achieved the impossible! He has actually managed to get a phone call through to Verano!

Tell me, how did you do it? Every time I phone the line is engaged. On the rare occasions that I have got through, I too have come up against the "waiting for parts" for Commodore machines, and many of these returned to me repaired have gone faulty again shortly after.

Of course, the customer doesn't seem to realise that this is not my fault, so I bear the brunt of their temper.

On the whole though, I would like to say that the service from Verano is satisfactory and it is not all that often that I have to contact them.

One more point I would like to make is that Amstrad computers are by far the most reliable available at the moment. Since we started dealing with the Amstrad range, we have had none back from the PC26 and PC range, and of the (CPCs), we only ever had one 128K monitor returned.

This was returned to Amstrad by us for repair, and to our surprise, a brand new monitor was delivered a week later. Surely that speaks for itself.

Name and address supplied

## The battle of the computers

I am writing with regard to the test made by Alastair Watt in Letters, March 29. In his test Mr Watt stated that the Amstrad PC showed incredible timings for drawing and calculating on the screen. Well, I have done the same test with my Atari ST and GFA Basic and frankly I think the PC1612 is far from "charismatic" as Mr Watt would have you believe.

The time on my ST was 14.1 seconds. Timing for the Spectrum showed 41.8 seconds and the so-called famous Amstrad PC 50 seconds. In other words the ST is 29 times faster than the Spectrum and four times quicker than the PC. If you

consider the fact that these are perhaps the most language to use on a 16-bit/20MHz system (in terms of speed that is), the reaction of Watt is saying that PCs are more than dated is logical.

The support Amstrad has had from the British press is unequalled in any other country. And so it is not difficult to maintain a so-called majority in the British computer world.

But look, dear readers, at what kind of machines you have bought. Spectrums which are completely out of the top 10 in Europe (even MSX is outstripping them many times), CPC models which use weird 3 inch discs and with very expensive options to change colours. Had to electricity all those users who had to upgrade from 48K to 64K to the 128K version to the PC16 "Joyce".

I think it is time that British users come out of their "mainstream" views of the computer industry and see what the rest of the world has to offer. MSX 2 is good and so are the Amiga and the ST. On the ST I have now five operating systems, GEM-TOS, CP/M, MS-DOS (in both Germany and far more compatible than the famous "emulator"), and OS-9.

I agree that you could stick with your old Spectry, but upgrading it for a PC is like selling a bike to use the local bus.

Now, why use them at all? Many business people and those who stick with old MS-DOS? Well, it means they are businessmen with no knowledge on the subject. So they are buying local bus tickets for the price of a Jaguar. It's not their money of course. No, it's yours.

Danny Scorsone  
Belgium

## Forcing black's queen

The readers' latest move in "Game Two at the Colossus chess tournament" is to attack black's queen with their bishop, forcing Colossus to move its queen to e6.

## Casting your vote

How would you continue the readers' attack? Send your duly printed move to either Inter-Mediate (Popular Chess), Freemantle, Norfolk (Amstrad), Herts CM21 8YA (no stamp needed), or Popular Chess, Unit 2, The Mailings, East-borough, Herts CM21 0PG (with a stamp).

All entries must reach either address by Wednesday, May 15.

The move which gets the most votes will be entered into the game. Results and Colossus's response will be published in two weeks time.

## Prizes

A British Museum reproduction Amen chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of Colossus Chess 4 will go to the most consistent entrants.

Next week, we return to Game Two, where the Readers are playing black.

## Game Two

1	White-K	Black-K
2	White-Q	Black-Q
3	White-P	Black-P
4	White-R	Black-R
5	White-B	Black-B
6	White-N	Black-N
7	White-P	Black-P
8	White-K	Black-K
9	White-Q	Black-Q
10	White-P	Black-P
11	White-R	Black-R
12	White-B	Black-B
13	White-N	Black-N
14	White-P	Black-P
15	White-K	Black-K
16	White-Q	Black-Q
17	White-P	Black-P
18	White-R	Black-R
19	White-B	Black-B
20	White-N	Black-N
21	White-P	Black-P
22	White-K	Black-K



We're sorry but Popular Computing Weekly cannot guarantee to reply to all letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages so, if possible, please do not send SAsAs.

Last week, we printed the first token and order form for the Popular Computing Spectrum Micro Source offer. Here is the second and last token you need to send for yours.

**Popular/Simmons  
Micro Source  
special offer**  
**Token No. 2**



# Atari plans research facility in Europe



The Mega ST - part of Frontier's push into specialist technology

ATARI chairman Jack Tramiel has plans to set up a 'software centre' in the UK later this year.

This is expected to be an advanced software development unit, along the lines of Sinclair Research's Metaball, set up in 1984 to research into hardware technology.

Tramiel is believed to be in negotiation with programming

teams to staff the unit, apparently the decision has been taken to place the software centre in the UK, due to the programming expertise in this country. While in the UK for the second Atari show, he is reported to have said, "I can smell the success here".

While it is thought that the research centre will be looking

at RISC (Reduced Instruction Set Chip) technology, no details have been released yet.

Atari is also considering setting up a research and development centre in West Germany, which will concentrate more on hardware innovations, and a computer manufacturing plant in North America. The Atari range of chips is currently manufactured in Taiwan.

Jack Tramiel "I can smell the success"



## Amiga 500 on show to over 18s only

Commodore has confirmed that it will launch the Amiga 500 to the public at the Commodore show, starting on June 12.

However, the machine will be displayed in the Commodore Business and Amiga Expo suite, which is only open to those over 18 years old.

The suite is an area which will specialise in new Amiga products for serious home and business use.

## Camel Eprom blower now from Alphacam

CAMEL Products' Eprom Blower (Epigram PB) is now available from Alphacam.

Epigram PB connects to any micro with an RS232 with RTS, DTR and CTS handshake lines.



Epigram PB costs £189.95 from Alphacam, and is available for the IBM PC, 8086, QL and Spectram micros. The price includes a cable and disc interface for QLs.

Details from Alphacam at The Old Millings, 125/6 Great Park, Cambridge CB2 3QJ, 0223 214214.

## Digital Research moves away from mass market

DIGITAL Research is to move away from the mainstream operating system market, and will be concentrating on vertical markets and multi-user applications, particularly with its Cam current DOS 286 systems.

However, DRI's UK vice president Paul Bailey said that this move would make no difference to work on Cam, the DRI operating system packaged with the Atari ST and Amstrad PC1512 machines, among others.

"We have three main markets," he said. "Multi-user micro, specialist industrial auto-

mation and graphics systems on DOS. We are totally committed to all three, although the main focus is on the multi-user markets.

"Cam is absolutely strategic to us; for example, when Atari brings out its new PC in August (see Popular Computing Weekly, May '9), there will be Cam Desktop, Cam Paint, and Cam Write on it."

Bailey also affirmed his support for Amstrad, should Amstrad bring out further versions of its PC compatibles later this year as expected.

## Correction

LAST week, we printed a picture on page 13 which we claimed was John Spoker of Micropro.

In fact, this was a disasterly lie, since it was Ray Evans of Origin/Micropro. The real John Spoker is pictured below.



## New micros for Flash Gordon

MASTERTRONIC is converting its Commodore 64 to: Flash Gordon to the Spectrum, Amstrad CPC, MSX and Atari 800 machines. The program will be available in June at Masterton's MMD range price of £299.



# Activision and Codemasters in Grand Prix row

A ROW is brewing between budget newsmen Codemasters and American-owned Activision over a recent Codemasters release, *Grand Prix Simulator*.

It is alleged similarities between that and the cheap Super Sprint, licensed by Activision, which is causing the argument.

Events started with Activision contacting Codemasters, alleging that *Grand Prix Simulator* — already a best selling title on the CPC — infringes its copyright and stating that unless the game was withdrawn from the market, a High Court injunction would be sought and damages claimed against projected loss of revenue.

Codemasters strongly denies the allegation and so far has refused to comply with Activision's demands.

Said Codemaster's David Corring, "They're both overhead racing games, but with that restriction, no specific points are the same. I'm confident that if it got to court, we'd win."

To date, both companies have put the matter into the hands of their respective lawyers, and the dispute remains unresolved.

The battle could prove something of a test case. Previous disputes over licensing copyright have usually concentrated on specific sprite design and screen layout — certainly not the case between GPS and Super Sprint. If Activision wins on the promise that the general game concept is part of the licence, the implications are enormous.

At the time of going to press, representatives from Activision were unavailable for comment.

## New report cites harm from VDU exposure

THE most detailed report so far into the effects of VDUs on users was issued last week, and concludes that VDUs are harmful.

The report was commissioned by the council workers' union NALGO, and published by the VDU Workers' Rights Campaign. It examined the effects of VDU use on 3,000 employees of the London Borough of Hammersmith, and found some startling conclusions.

Most reports of the nature have proved inconclusive. However, at the NALGO report more than three-quarters of those users who were interviewed complained of blurred vision and painful eyes. Psychological and visual effects such as depression were common, particularly among women.

Further problems, such as stress, are caused by computer breakdowns and printer noise.

In other countries, for example Sweden, Norway and West Germany, VDU users are protected by statutory health and safety legislation. But in the UK there is no such legislation only employer-specific agreements.

"We can't understand the reluctance to have VDUs built to current standards. It's vitally important that they are," said campaigner worker Irene Hamilton.

Hamilton wants to see all VDUs shielded against electromagnetic radiation at the point of manufacture.

"And all equipment should come with an anti-glare screen and a detachable keyboard," she went on.

The report is available from the VDU Workers' Rights Campaign, City Centre Project, 32-35 Featherstone Street, London EC1.

## SOFTWARE HOTLINES



**Distortions** — quite a sensible name for a new games computer for the PC, from veteran **Design Design** which, believe it or not, has been around now since early 1982.

The compilation contains conversions of 300 of its recent releases. **MEOW! On The Run** and **2112AD** which, **Design Design** say, covers all the ground between shoot-em-ups and problem solvers that should "satisfy even the Mamee needs". Err, kids, if you had a Mamee mind, would you buy a PC?!

Another sensible name, **Seasible Software**, whose previous efforts include *Garabirds* and *Paxifax*.

Sensible is an Essex based programming duo consisting of Jon Hare and Chris Yates who have just written a great little game for Cussie, called *Wanted* (see notes that follow), in which you play the part of a wizard and his cat. What has happened is that an evil mouse has stolen all the columns out of the eight levels of the game, a situation you must rectify.

As you might guess from the title of the game, there's quite a bit of bounciness involved, so your wizard is in trouble from the most of the time, but there's one half of a lot of shooting as well, with an extra-power thing artistically inspired by *Home*!

et al.

The total extra power to get in the cat which appears as a smaller ball, following you around — but under independent control when the fire button is depressed. It's with the cat that you have to collect the drops of paint that fall to the ground when you eat certain blobs.

Out at the end of May on Commodore, Spectrum and probably Amstrad, too, it's well worth a look.

But, let's face it, there are times when nothing but a bit of gratuitous violence will do, so why not load up *Prohibition*, from **Infogrames**.

On ST now, with 300 versions following, you are faced with the foot of a building, around which you smoothly scroll, blowing away gangsters that appear at windows, under chain covers, etc. Failure to do this within a strict time limit will result in your character's Good stuff.

Hey! Licensing deal of the year. The kids will love it, but takes me not hold a candle to the sales and it could be the saving of the whole of **Argus Press Software** — from **Quick-alive**, **The Tube**.

But wait. No Paula. No JoJo. It's a shooter. SSS, if only they can get *Type Text* to ban it, who knows...?

John Cook





DIARY  
DATES

## MAY

8-10 May

**The Electron & BBC Micro User Show**

Reed International Hall, London  
**Details:** Software, hardware and peripherals for Acorn's micros  
**Price:** £3 adult, £2 children, £1 discount for advance booking  
**Organiser:** Database Exhibitions,  
 051-455-8835

12-14 June  
**Commodore Show**  
 Novotel, Hammermith  
**Details:** First public showing of A500 and A2000 Amigas  
**Price:** £3 adult, £2 children  
**Organiser:** Database Exhibitions,  
 051-455-8835

## JUNE

12-14 June

**Commodore Show**

Novotel, Hammermith  
**Details:** First public showing of A500 and A2000 Amigas  
**Price:** £3 adult, £2 children  
**Organiser:** Database Exhibitions,  
 051-455-8835

30 June-2 July

**PC User Show**

Olympia, London  
**Details:** Hardware and software for all users of IBM PCs and compatibles  
**Price:** £5  
**Organiser:** EMAP International Exhibitions  
 01-895-1151

30 June-2 July  
**PC User Show**  
 Olympia, London  
**Details:** Hardware and software for all users of IBM PCs and compatibles  
**Price:** £5  
**Organiser:** EMAP International Exhibitions  
 01-895-1151

## JULY

10-12 July

**Amstrad Computer Show**

Alexandra Palace Pavilion, London  
**Details:** Displays and demonstrations of all latest hardware, software and peripherals for Amstrad computers  
**Price:** £3 adult, £2 children, £1 discount for advance booking  
**Organiser:** Database Exhibitions,  
 051-455-8835

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organisers before attending. Popular Computing Weekly can't accept responsibility for any alterations to these arrangements made by the organisers.

## Off the Hook follow-up tape to aid NSPCC

A CHARITY tape in aid of the NSPCC is to be launched this summer, "probably in June".

The organisation behind the publication of the tape is being co-ordinated by Peter Gowers of Advertis, as a follow-up to previous ventures, *Softaid* and *Off the Hook*.

"The compilation is in the final stages of assembly," said Gowers. "It will include *Kico* by Angel Press, *Digital's Night Digger*, *Realtime's Starstrike*

(1), and *Gemini's Morry* on the Am, so far, and there will be ten titles in all.

The compilation has been put together in conjunction with the NSPCC, which has donated packaging, and will sell the tape in its own stores. It will also be available in normal computer outlets. The compilation will be available for Spectrum, Commodore and Amstrad machines, and full details will be available in the next couple of weeks.

So far, the software industry has raised more than £30,000 for the NSPCC, mainly from its Indie Dinner last December. But Gowers says that about 10% of the money pledged by companies has still not been paid.

"I hope that we'll raise more than £100,000 for the NSPCC," said Peter Gowers. "That will make it the third year running that we've raised over £100,000 for charity, after *Softaid* and *Off the Hook*."

## IGS word processor out in UK

MGA Microsystems is selling *Graphcenter* for the Apple II/5 from Cardiff-based company Graphix.

*Graphcenter* is a page layout program, incorporating word processing and drawing functions, all mouse controlled. Graphix can also be ported over from other programs such as *Paintworks Plus*.

*Graphcenter* costs £149.45 inclusive. Details from MGA Microsystems, 140 High Street, Tisbury, Kent GU30 5HT, 05805 4278.

## Silent Service banned in West Germany

This simulation game (*Silent Service*, by Microprose) has been banned from open sale in West Germany.

The ban comes under the Youth Dangerous Publications List legislation, apparently *Silent Service*, which simulates a World War II submarine operation is "too realistic".

The decision means that the game has been relegated to regulated outlets such as sex shops.

Microprose's president Bill

Stealey plans to appeal against the ban.

Microprose has moved into the hardware market with the announcement of a second joint venture agreement with a US company.

Following last month's deal with Origin, Microprose has signed up with Suncom, to distribute a range of joysticks and peripherals, including monitors and accessories such as disc storage cases and printer stands.

Major Bill Stealey of Microprose with some of the company's "controversial" products.



## Audiogenic needs programmers

AUDIOGENIC, admitting that it is no longer in the top ten of software companies, is starting a recruitment drive for programmers.

The company is offering an Amiga 500 for any programmer it takes on whose program then makes the top ten in the Gallup software charts. An Amiga 2500 goes to any programmer whose product makes it to number one.

Audiogenic can be contacted at 11 Children Enterprise Centre, Station Road, Totter, Berkshire, BT34 3DQ.



# TECHNOLOGY SO ADVANCED ...

**DESIGN**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**ARCHITECTURE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**GRAPHICS**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**PERFORMANCE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**PRICE AND VALUE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)



**STANDARD SOFTWARE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**DESIGN FEATURES**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**OPERATING SYSTEM**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**PERFORMANCE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

**PRICE AND VALUE**  
 • 16-bit micro-processor based  
 • 128K on-chip ROM (expandable to 512K)  
 • 640K on-chip RAM (expandable to 1MB)

## ... IT'S AFFORDABLE

### ONLY FROM SILICA

Atari ST is the most advanced and powerful personal computer available today. It's the only computer that can do everything you need it to do, and it does it all in a package that's as small as a shoebox. With its 16-bit micro-processor, 128K on-chip ROM, and 640K on-chip RAM, it's the most powerful personal computer available today. And it's all in a package that's as small as a shoebox.

**FREE STARTER KIT - Only From Silica**  
 When you buy an Atari ST, you'll get a free starter kit. This kit includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**DEDICATED SERVICE - Only From Silica**  
 When you buy an Atari ST, you'll get a dedicated service. This service includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**THE FULL STOCK RANGE - Only From Silica**  
 When you buy an Atari ST, you'll get the full stock range. This range includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**AFTER-SALES SUPPORT - Only From Silica**  
 When you buy an Atari ST, you'll get after-sales support. This support includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**FREE CASH PRIZE - Only From Silica**  
 When you buy an Atari ST, you'll get a free cash prize. This prize includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**FREE OVERNIGHT DELIVERY - From Silica**  
 When you buy an Atari ST, you'll get free overnight delivery. This delivery includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**PRICE MATCH - Only From Silica**  
 When you buy an Atari ST, you'll get a price match. This match includes everything you need to get started with your new computer. It includes a copy of the Atari ST User's Guide, a copy of the Atari ST Software Guide, and a copy of the Atari ST Hardware Guide. It also includes a copy of the Atari ST Software Guide, a copy of the Atari ST Hardware Guide, and a copy of the Atari ST User's Guide.

**SILICA (S. Mail Order)**  
 1st Floor, 100, Northway Road, Barking, Essex, DA9 4JH  
**01-509 1111**  
**LONDON**  
 1st Floor, 100, Northway Road, Barking, Essex, DA9 4JH  
**01-509 1111**  
**LONDON**  
 1st Floor, 100, Northway Road, Barking, Essex, DA9 4JH  
**01-509 1111**

### 520ST-M

The 520ST-M is the most powerful and advanced personal computer available today. It's the only computer that can do everything you need it to do, and it does it all in a package that's as small as a shoebox. With its 16-bit micro-processor, 128K on-chip ROM, and 640K on-chip RAM, it's the most powerful personal computer available today. And it's all in a package that's as small as a shoebox.

**£259**

### 520ST-FM

The 520ST-FM is the most powerful and advanced personal computer available today. It's the only computer that can do everything you need it to do, and it does it all in a package that's as small as a shoebox. With its 16-bit micro-processor, 128K on-chip ROM, and 640K on-chip RAM, it's the most powerful personal computer available today. And it's all in a package that's as small as a shoebox.

**£399**

### 1040ST-F

The 1040ST-F is the most powerful and advanced personal computer available today. It's the only computer that can do everything you need it to do, and it does it all in a package that's as small as a shoebox. With its 16-bit micro-processor, 128K on-chip ROM, and 640K on-chip RAM, it's the most powerful personal computer available today. And it's all in a package that's as small as a shoebox.

**£599**

# ATARI ST

The Silica Shop Ltd (Dept PCOM 888), 1st Floor, Northway Road, Barking, Essex, DA9 4JH

**PLEASE SEND ME FREE LITERATURE ON THE ATARI ST**

Name: \_\_\_\_\_ Title: \_\_\_\_\_ Surname: \_\_\_\_\_

Address: \_\_\_\_\_

Postcode: \_\_\_\_\_

Please send me literature on the Atari ST. I will return this card to you.





NEXT  
WEEK

## Load It

Help is at hand for all users of Commodore's CSM database recorder. Load It claims to solve alignment problems once and for all. Chris Jenkins checks it out.

## Spectrum keyboards

Anthony Reid takes you through a DIY project to build your own Spectrum keyboard. If you're still suffering with the rubber keys, or down on your hands and knees picking up loose keys from the Spectrum Plus, this could be the article for you.

## Software

Everything You Ever Wanted to Know about Graphics, the Universe and Everything on the 6266. Sir... that's a product 6266 file that out just how comprehensive it is. Plus Maxam II by Amos, an assembler and monitor for Amstrad CPM Plus.



## Amstrad DMP4000

Tony Rendle tests Amstrad's latest printer, promoted for the PC1616 range, but compatible with any micro with a standard parallel printer output.

## Programming in C

Rene Garneau continues his series on programming in C, taking you further into programming techniques.

## Z88 DELAYS CONTINUE

Sir Clive Sinclair's Z88 portable machine is suffering further delays and first orders are not now expected to be delivered until mid-May. However, Sir Clive is already talking to retailers about the possibility of stocking the Z88 in the summer.

The Z88 - still not delivered



He puts the delays down to merging the software suites together as a whole. "It's still not complete - we've got the chunks, now they need to be merged into one."

Sir Clive would not reveal how many orders had been placed

for the Z88 so far, but he did add that he was waiting up a second production line for the machine, in addition to Thom Datatouch.

"The deal hasn't been signed yet, so I can't name names at the moment, but the second line will be there," he said.

Locoscript II  
now due in  
mid-May

THE "interim" release from Locomotive Software of Locoscript II, the long-awaited upgrade to the word processing software bundled with the Amstrad PCW machines (see Popular Computing Weekly, April 17), is now scheduled for mid-May, with the first copies going out around May 12.

According to Locomotive, all those who have already ordered the program will have been informed by letter of the precise despatch date, and it was emphasised that no shipments would be delayed until that time.

RPGs in new  
TV series

AMSTRAD TV is to transmit a networked series on role playing games in September. The series will take the form of an actual game, Knight Mare, being played on air.

Although it will be screened during the late afternoon, Amiga hopes it will attract a number of adult viewers.

Computer game rights to Knight Mare are expected to be announced within the next week or so.

Electronic Arts  
gets Batteries

ELECTRONIC Arts has acquired Batteries Inc., the Canadian software house best known for its Rapidscript word processing package.

The deal should make Batteries products more readily available in this country - Electronic Arts recently set up its own office in the UK (see Popular Computing Weekly, March 27).

Mastertronic drops  
Melbourne's  
Gadget

FOLLOWING the news, last week, of the majority of the Melbourne House staff to the Mastertronic (Paul G) offices, came an announcement concerning the fate of the Melbourne House game, Inspector Gadget and the Circus of Fear.

Inspector Gadget, which had reached an advanced stage of production, will receive copies already sent out to the press, has been withdrawn.

According to Mastertronic's Frank Herman, the reason's behind the decision were simple.

"It wasn't as good as the average Mastertronic game - so we couldn't justify asking full price for it," he stated.

Programmed by Australian software house, Beam Software - author of much of the Melbourne House output - Gadget was an arcade game based on a French Cloussou-like cartoon

character, and according to Herman, Beam has "accepted the decision as far."

The software industry has not lost the last of Gadget however, as the licence has been maintained and another game based on the character will be written by Beam, with release around the time of the PCW 8386.

Herman continued, "We're committed to producing super software from Melbourne House," adding somewhat bluntly, "It would have to be superior to be as good as Mastertronic."

• The last two arcade machines from Arcadia, the new Mastertronic financed coin-op designers, have almost been completed - including a product under the name of Rockford (see last week's Hotlines for details).



**MICROPROSE**  
SIMULATION • SOFTWARE



Microprose, the World's leading software simulation company and creators of F-15 Strike Eagle, Silent Service, and Gunship - 'the new and ultimate helicopter simulation'.

\* \* \* \* \*

Microprose invites new and original games with a view to software being published worldwide. Microprose can offer high advances and top royalty rates to the sort of people who can produce award winning software within the confines of 8- or 16-bit machines.

## ***CAN YOU MEET THE ULTIMATE CHALLENGE?***

**PLEASE CONTACT:  
THE SOFTWARE DEVELOPMENT MANAGER  
MICROPROSE SOFTWARE LTD  
2 MARKET PLACE, TETBURY  
GLOUCESTERSHIRE GL8 8DA**



**RANARAMA BY STEVE TURNER**  
*JUST ONE OF A STRING OF ORIGINAL HITS FROM*

**HEWSON**

## **WE'RE GRABBING GAMES!**

*We're scouring the country, we're looking everywhere.  
Searching high, searching low. Under every stone, behind  
every door.*

## **WHAT ARE WE LOOKING FOR?**

Games. Computer games. Simple games, sophisticated games. Long games and short games. Quick games and quirky games. Shoot-em-ups and arcade adventures, sports games and combat games. All different sorts of games. You name it, we want it.

If you've got a game, send it to us now for an instant opinion. If we like it we'll pay you well for a good job well done. And if we like you we'll guarantee you original and/or conversion work for the future if that is what you want.

***So grab yourself a piece of the action. Send your game NOW to:***

**Mr Mark Whiffen,  
Assistant Product Manager,  
Hewson Consultants Limited,  
568 Milton Trading Estate,  
Milton, Abingdon, Oxon  
OX28 1 832939**

**HEWSON**





# PROGRAMMERS!!

The definitive reference guide for all aspiring game programmers

FREE when you subscribe to:

## POPULAR COMPUTING WEEKLY

- ★ Will help you write high-quality marketable computer games software.
- ★ Explains what qualities you need to succeed and the pitfalls to avoid.
- ★ Extensive advice on writing and marketing the software.

### ORDER FORM

Please enter my annual subscription to Popular Computing Weekly at £25.00 UK, £35.00 Overseas and send me my FREE copy of "Success in Software"

☐ Please debit my Access/Visa/Master card no:

☐ I enclose a cheque made payable to:

Samtime Publications Ltd.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Expiry date: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Return this form to: PCW Subs., 12-12 Little Newport Street, London WC2H 7PP, UK.



You've played The Hobbit ...  
You've played Lord of the Rings ...

Now play Shadows of Mordor ...  
Lord of the Rings Game 2

THE MAIL ORDER SOFTWARE SOCIETY  
**'THE BEST THING  
SINCE SLICED BREAD'**  
"Try Before You Buy"

GAMES FOR  
SPECTRUM - MSX - AMSTRAD - COMMODORE  
BBC - ELECTRON - ATARI

IT COSTS NOTHING TO FIND OUT

Send your name, address and which computer(s) you have to  
(No money required)

**M.S.S.**

FREE POST, P.O. Box 57, Doncaster,  
South Yorkshire DN4 5BN

## TALENT

COMPUTER SYSTEMS  
SINCLAIR QL SOFTWARE

Find out about our great range of exciting new top quality  
programs - utilities, graphics and games. Please write for  
a FREE illustrated Mail Order Catalogue today!

**TALENT COMPUTER SYSTEMS**

Dept PCW  
Cowan Building  
101 St. James Road  
Glasgow G4 6NS  
Tel: 041-552 3138



# CRIME AGAINST COMPUTERS

Computer crime is not an area that most people take seriously. But quite a lot of damage can be done by computer criminals, and, as John Brissenden reports, the trend is growing.

**T**hey call it "white-collar crime." A lot of people don't take it seriously until it happens to them. But the problem is growing all the time.

It used to be a blanket term for company fraud, but is now more closely linked with computer crime—fraud, theft, arson, sabotage, forgery or other misuse with, or of, computer systems.

The effects of computers are growing in all directions. There are more systems in use. Computers are handling more information. They are becoming more powerful and complicated. And more people are using computer systems.

So a major net result of all these factors is the growth of computer-related crime.

The area where most computer systems are used is within companies' business systems. So it is here that most computer crimes are committed. Some are plain fraud, committed for financial reward.

But others are more concerned with the computer system itself, and causing damage to it. This could be sabotage or malicious damage by someone outside the company, or by an insider. This could take the form of physical attack, eg. arson, or more often gaining access to restricted information, or even tampering with programs so as to cause real and untraceable internal damage to the system—locking. A third major area is software theft, or piracy. Computer-related crimes are hard to define, hard to quantify, and even harder to spot. Why?

Detective Inspector John Austen is in charge of the computer crime unit of Scotland Yard. His team is part of the company fraud department of the fraud squad, and it's their job to deal with a whole range of computer-related offences.

It's the kind of crime that has a high public profile. It makes good news copy, and it's good box-office news as well—the young whiz-kid who gets caught fiddling millions of dollars out of a company, or the teenager who accidentally starts World War II on his main.

But although the reality is sometimes nearly that spectacular, most of the time it may be mundane, or even unknown.

It could be the case whereby a fraud has been committed, sometimes for large amounts of money, and it just so happens that a computer system is the vehicle that

just processes through the information," says Austen.

"We've had several instances where somebody's stealing money from a local

*"It's the kind of crime that has a high public profile. It makes good news copy, and it's good box-office news as well."*

government authority and they're in a department of the authority that deals with assets and wages, and they just write out the form, Spurious form, spurious account, spurious personnel, and they'll just feed it in. Now it's open to interpretation as to whether that is a computer crime or not."

Another problem is that if a company discovers that an employee has been carrying out a fraud or other crime through the computer system, they are often reluctant to report the fact to anyone, including the police.

Some industry watchdog bodies, such as the Federation Against Software Theft, have put out estimates. FAST reckons that software theft or piracy alone is costing the industry £150 million a year. But Austen agrees that certain factors make it virtually impossible to gauge the size of the problem.

"How long is a piece of string? I think it's fair to say that there is a certain reluctance to report crime that's computer-related, more than say a person being mugged in the street or having their home broken into, because there are different considerations from the point of the victim... a certain amount of guiltily or embarrassment, which can reflect their back on the victim, whether it be a company or a person.

"So I think that that's a fair estimation of perhaps why there is some reluctance. Although it's no good asking for hard evidence of it.

"One thing that I try to warn people about a little... I think that there are people who work in computing who are addicted to it, in the sense of they just won't leave the damn things alone.

They'll play chess in their lunchtime, they'll go home, they sit and play Space Invaders all evening. There is a danger from people like that, because they fit a casting of boredom.

This is the dilemma—if you want the brightest of bright young whizzpeds, he more than likely will be hooked upon his subject. But there are dangers in people who get hooked upon computing."

Do they consider the possibility of being detected?

"I don't think they do. If there is one thing that's rather unique about people who commit computer crime, it's that they tend

continued on page 14 B



Detective Inspector John Austen in charge of computer crime, Scotland Yard.



# SPECIAL FEATURE

4 continued from page 12

**"The area where most computer systems are used is within companies' business systems, so it is here that most computer crimes are committed"**

to be less offences. But that does tend to be rather unique with this sort of crime."

So how can the police attempt to combat computer crimes? Do the police Crime Prevention Departments have a role?

"They have given advice to companies, but the sort of crime prevention area that they cover is slightly different to ours. Whereas they will cover the physical side of securing policies, controls, etc, we tend to look and talk more about the legal and procedural side.

"It's talking about access levels, password controls, data processing procedures, encryption, what encryption to use if it's necessary, supervision of personnel."

"And I believe in pay'n' and don't. What I mean is that if I make a point, for instance about the use of passwords, we are in a position to give an example perhaps of an instance where that has led to problems."

"So it's all very well and good people talking about 'One should do this, one should do that,' but if you can show people by example, although not named example obviously, of the sort of things that have occurred, it brings it home to them."

"Even if you had a large establishment where you have a computer operator who's separate from a computer programmer, in my experience you often find that the operator is studying at night school to be a programmer anyway. And the programmer is studying at night school to be a systems analyst, and the analyst is studying to be a DP manager."

"So one never takes it for granted that because somebody is a mere data entry clerk that they don't know how to load a disc into a machine, because they probably do."

"I decided four years ago, that if we were going to provide the public with a service in the police force that was going to give them specialist expertise in this field, that it would be necessary to put ourselves on something of a public platform, by going out and talking to people in the industry."

"We needed to make them aware of what we saw as the dangers and risks, the sort of things to look for, to make them aware of the issues that can be sustained through determined attacks on a computer system, and at the same time, to let them know that we are here not only to investigate crime, which is our primary role, but also to offer advice."

"And judging by my postbag and the telephone calls that we get, the latter has overtaken the former."

The area of computer crime that has had most coverage recently is hacking. The unauthorised access to data. Austin uses this as an example of how the unit secures convictions in this very difficult area. But is hacking as much of a danger to some people believe?

"I think that it's probably more type. The type that's generated tends to encourage people to try and do things that they can't do."

"Your normal teenager who's got a BBC micro and plays games on it, as quite a few of our youngsters do, gets bored with that and then they buy a modem and suddenly they're interested in public exchange networks, and probably think they have more capability than they do."

I mean there's a lot of hype been generated about so-called secure systems like banking systems.

"How whatever technology is produced and whatever enhancement one can put to it means it is not possible with your BBC to start hacking into Baggot Bank - you can't do it."

"The Forgery and Counterfeiting Act of 1986 caters for the making of false instruments, with the intention of deceit, whether it be manual or electronic. And that's the Act upon which we prosecute hackers."

"Now what I mean by that is let's say you and I work for the same company. You have got access to our coded payroll. I haven't got access to the payroll, but I know what your password number is. So I do a combination of things to try and get your

password."

"Immediately I attempt to do that I cannot log on to the database."

"Now this is particularly pertinent today to those ATM machines, those cash dispensers. A lot of people are under a misapprehension here. If I find a card in the street, if I don't know what the number is, there's no way that I'm going to find out what the number is. But let's just say I'm tempted to stick that card into a machine and as I don't know, I'll tap in one, two, three, four."

"What people may not realise is, that by doing that, putting in one, two, three, four, they are attempting to forge an instrument."

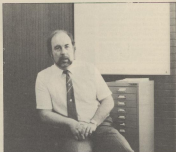
Finally, how does Austin think that people, including the police, can arm themselves against fraud or damage through their computer products or systems?

"It is knowing what to look for, there is a certain amount of knowledge obviously that has to be gained on part of the investigator to know what one is going to go for."

"I investigated a couple at the National Police College specifically to train officers from other forces. The purpose of that is so that each police force in this country will have at least one officer who is computer literate."

"All we're doing is taking experienced detectives and we're topping them up with some computer knowledge sufficient, one hopes, to be able to deal with the evidential requirements of computer-related crime."

"Bearing in mind that some people spend their whole life in the industry and still don't know it all, there's no such thing as a computer expert and, they do not exist."



Austin: "We are here not only to investigate crime, but also to offer advice."







# Let your PCW do the talking

Lacking an RS232 interface, the PCW hardly seems an ideal micro for communications. Peter Worlock tries out Miracle Technology's WS4000 modem, which could change all that

Computer communication's had something of a coupé reputation among compatible users.

Enthusiasts take it as the best thing since the computer itself. The majority of users look on it as something potentially great - with a heavy emphasis on "potentially".

But it's easy to overlook how far things have come in a few years. It isn't so long since communications meant manually-operated modems, all operating at 300 baud, and the only thing to connect to was an enthusiastic but amateurish bulletin board.

Now there are hundreds of bulletin boards, all of them enthusiastic but the majority of them highly professional.

There is also a host of commercial services from the ubiquitous Prestel to electronic mail facilities.

And, not least, there has been constant development of the modems themselves. Today, the auto-dial, auto-answer, multi-rate, "intelligent" modem is commonplace.

For some computers remain better suited to communications than others, and if you had to pick one that looked like a loser in the current stakes, you'd probably lag the Amstrad PCW.

For one thing it lacks an RS232 interface - the primary requirement of would-be communications. And the lack of colour and variable graphics put it behind the field for services like Prestel.

Now PCW owners have been given a boost by Miracle Technology. The Ipswich-based modem maker has released a special version of its award-winning WS4000 intelligent modem.

When coupled with a good software package like Sagecraft's ChatClear (see page 4), the WS4000 allows PCW communications to hold their heads high.

## Features

Instead of the usual RS232 cable, this version of the modem has a ribbon cable terminating in an edge connector that plugs directly into the PCW's expansion bus.

This means that fitting the modem to the micro is simple, and eliminates the need to buy an extra interface.

Miracle Technology has established a reputation for quality in the modem market, and this version of the WS4000 will do it no harm.

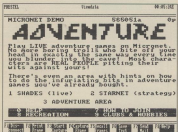
The modem is housed in a rather startling shade of red, but is well-built with solid connections to the serial, phone and power cables. All cables go into, and emerge from, the rear of the unit which also features a reset switch.

The modem's mouth is a size and shape to comfortably accommodate a telephone on top, but the ribbon cable is of precisely the right length to give you only one possible position - immediately next to the right side of the monitor.

Since this is where 99 per cent of PCW owners will have their printers, some rearranging of the desk will be necessary.

Pressing the reset switch, and turning the power on and off at the mains is as much as you can do from the outside. Everything else is controlled through software. For this reason, you'll need a decent software package to get your money's worth from the hardware.

Along the front of the modem is a row of status lights. These indicate power on, high speed mode, on line, terminal ready, request to send, clear to send, carrier detect, send data, receive data, and auto-answer mode.



"Miracle Technology has established a reputation for quality in the modem market, and this version of the WS4000 will do it no harm!"

These lights may be off, blinking or steady on, depending on the modem's activities. Once you become familiar with them you can determine at a glance the status of the modem, and whether it is functioning as expected.

You can watch them putting out the number being dialed, and you'll also see







# Precision sets new records with Superbase Personal

Precision Software, best known for its Commodore 64 word processing and database programs, has turned its attention to the 16-bit machines with Superbase Personal. Christina Erskine finds it combines power with ease of use

Precision Software is probably best known for its Superbase and Superwriter database and word processing packages for the Commodore 64. Therefore it would be a logical assumption to see Superbase Personal for the Atari ST as simply a conversion of the C64 product. Logical, but according to Precision's managing director John Tanner, completely incorrect.

Tanner — and he should know, his brother Simon wrote both programs — says that Superbase Personal has been written

entirely from scratch. The name Superbase being duplicated only to give the product a familiar identity with potential buyers.

Superbase Personal runs under Gem (a Gem-based version is also available for PC compatibles) and uses all the familiar drop down menus, etc., running in medium and high resolution modes only.

Getting going with Superbase is rather deceptive; it's wretchedly simple, and betrays the program's power. You might expect a menu-driven database to be complicated

by sub-menus, sub-sub-menus, and no Cancel option just where you wanted it, but all Superbase's capabilities are accessed by the six menus at the top, where you would find the Gem Desktop options, and a string of easily understood icons at

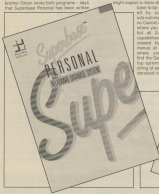
the bottom.

For instance, once loaded, Superbase gives you the choice of Desk, Project, Record, Process, Set and System menus.

Desk simply gives you the copyright message. Project is the menu you will need straightaway; its options deal with opening, creating, editing, etc., your files and indices. On start-up, many menu options are unavailable, these are shown in faded rather than black type.

The Record menu contains options for attending your individual database records, or adding to them. Process deals mainly with importing files from other programs and printing labels. Set enables you to alter the way in which your database is laid out. System gives you printer options, a directory list, etc.

In addition to this, you get the remarkably easy-to-grasp menu at the foot of the





# SOFTWARE REVIEW

screen for flipping through, viewing and creating your records. The menu comprises icons bearing more than a passing resemblance to the controls on a tape recorder.

Thus > shows the next record in the file, < the one immediately previous, >> is a 'fast forward' - display all following files, << a 'rewind' - display all previous. There are also 'pause' and 'stop' buttons.

The 'F' icon allows you to search for a particular file by typing one value from the field in the record you need, and the program will bring the required record up on screen. However, the key symbol for manipulating your databases is contained in the square icon.

This is the 'filter' option, which enables you to view, use or print out your data according to a set of parameters which you determine. You select which of your fields you want to manipulate and then how you wish them manipulated. The symbols, as shown in the screen picture, are mainly self-explanatory: the same as, greater than, greater than or equal to, lesser than, lesser than or equal to.

'LIKE' applies to text strings, '=' to

numbers. You set the parameters themselves by typing in the information in the 'Value' box; for example, 'Lastname LIKE [A-D]' gives you all surnames on file beginning with A, B, C or D.

Creating files and records templates is also made easy. The number of fields is limitless, with the restriction of 255 characters per field, though surely, for most people, numerical data can be entered in a number of ways according to how you wish it presented on-screen, similarly with dates.

One of Superbase's most attractive features is its ability to port over files from other products. For text, these must be ASCII format, others existing; however, in Superbase's ability to incorporate pictures from graphics programs - so long as they run under Gem.

The most obvious uses for this are plans, charts, or pictorial representations of statistics which you may want to incorporate in standard letters.

## Conclusions

While I have talked about Superbase, it is

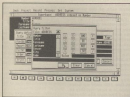
worth noting that the Superbase manual (which is clear and thorough, with plenty of tutorial sections) does not attempt to explain databases, it assumes you know the terminology and how databases work.

This article by no means exhausts the program's options and capabilities, but attempts to give an overview of how it works and salient features.

I found it versatile and comprehensive, and incredibly easy to get into. Obviously, this is due in part of Gem and the simplicity of mouse control, but all credit to Precision for not complicating the matter.

If you feel you could do with a database program for your Amiga, PC or compatible (with Gem) or Atari ST, Superbase Personal is worth close investigation.

**Program:** Superbase Personal Merges Atari ST, Commodore Amiga, IBM PC compatible with Gem operating system, eg. the Amiga PC 1512 **Price:** PCs and ST £99.95, Amiga £149.95 **Supplier:** Precision Software, 8 Park Terrace, Worlecliffe Park, Surrey KT14 3JZ.



Screens from Superbase Personal. Above: into the 'tape recorder' style bottom menu for viewing your records. Right: the filter screen enables you to sort records according to a large number of criteria.

## Filter Filter ADDRESS

Title	[↑]	=	OR	AND	+
Forename	[↓]	<	>	OR	-
Lastname	[↑]	<=	>=	NOT	*
Street	[↓]	<	>	LIKE	/
City	[↑]				
Code	[↓]				
Country	[↑]				
Value					

PC: "USA" OR Country LIKE "WEST GERMANY"

[OK] [Clear] [Cancel]

## Guide to databases

A database is basically a computerised filing cabinet, used for storing records in databases of any power whatsoever, the information can be indexed or sorted according to the various headings you've used within each record. You could, for instance, list all your friends living abroad, all customers still owing money after a year, etc.

Many databases have an integrated 'mail merge' or label printer within the package. You can then print address labels of all, or some, people on your database according to the index you have made.

**File** Collection of records running under the database program.

**Records** Similar to each file or sheet is a filing cabinet.

**Fields** This is the name given to the headings within each record. For example, in a simple 'address book' database, your fields might comprise 'last name', 'first name', 'address' (subdivided into, say, street, town, district, country and postcode), 'telephone number', etc.

**Relational database** A database which allows you to sort your records according to multiple factors. For example, print out all records showing people whose surnames begin with F, living in Yorkshire, have 2-4 children, plan to take a holiday in Spain within twelve months, and don't own a dog.

Having the ability to print out all records with people whose surnames begin with F is not enough to qualify an relational database is a good example of relational database.

**Integrated database** A database program which can use and incorporate information from other programs - usually the database will be part of a suite of programs in one package - and whose files can be incorporated in the other programs in the suite.

**Mail merge** Printing standard letters, labels or forms where only the name and address, for example, need be changed from sheet to sheet. You specify whose name is to go in the 'gaps' and each letter, addressed to each individual, is printed out.



# PEEK & POKE



with Ken Garroch

## The Sord connection

At Duxford, Cambridgeshire, I met:

**Q** I've just bought a Sord colour monitor (second hand) which I'd like to use instead of a TV, with my Spectrum and QL.

I have now discovered that there is a different plug on the back of the monitor to my composite video phono (Opus disc) plug on the Spectrum and certainly the QL. I realise that the Opus output is monochrome and have made the well known 'tap from the modulator' modification as well. This appears as a phono socket at the side of the Spectrum.

As I get the monitor cheap, I was too thrilled to check it out. I'm not sure what type of signal the monitor expects.

I enclose a diagram of the plug which appears at the back of the monitor. The model number of the monitor is GMP-14C.

I hope that you can help me with this problem by supplying a pin for pin diagram or something that I can make into a converter lead if that is what is needed. I'd really like to find some way of making both computers work with this monitor, but any help on either would be appreciated.

I might be able to afford the Adapt RGB Spectrum Interface if necessary - will you comment on this, or suggest some other alternative?

**A** I don't know what the connections are for this monitor. However, there is a way of finding out by educated guesses. If the monitor is RGB, then there will be Red, Green, Blue, Sync and Ground connections. If it is composite video, there is just composite input and ground. If any, of course. Have both these then are enough connections available.

The way it tied out is to take the composite output from the Spectrum, and split it into its two component wires, video and ground. If you connect the ground to the casing of the socket, with any luck, this will be ground. Next, take the video output from the Spectrum into each of the holes in turn.

If you get a red, green, or blue screen on the monitor, then you have found the R, G, or B inputs respectively. If you get a picture, then you will have a composite input. Once you have this, take the ground wire (which I find each of the other holes to find the ground input). The picture should stabilise when you get the correct combination.

By the looks of the socket, it is more likely to be RGB than composite so, having found the R, G and B inputs, you need to find sync. This can be done by connecting the QL's RGB lines to the appropriate holes, and then going around with the sync line to get a stable picture. If it is RGB only then the Adapt interface will be needed to get the Spectrum to work.

Make sure that any test connections you make are only brief, the voltages used are small and it is unlikely any damage can result if you are careful.

If all else fails, someone will, hopefully, write in and tell me what the connections really are so that I can print them.



Sord colour monitor GMP-14C socket

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem **Peek & Poke** is to Ken Garroch and every week he will PEEK back as many answers as he can. The address is **Peek & Poke**, PCW, 12-13 Little Newport Street, London WC2N 6PP.

## Baffled by the BBC bytes

Don Henley of Chippingham, in Wilt, writes:

**Q** I have a Master 128 with one 5 1/4 inch floppy drive, a ZX1000 printer and a VGA. In the March 27 issue of *Popular*, you published three programs for the BBC. I have just entered the sideways print utility. Having just spent the last hour double, triple, and quadruple checking my typing, could you please clarify a couple of points of interest to me:

1) Why does the program stop at line 80 with 'Byte at line 80'?

2) On re-entering the line at 80 with LDA #BCF (not SCF), it then prints a solid line down the left hand side of the screen and stops.

I'm baffled.

One other point which you might be able to help me with is this: if I deliberately omit the semi colon in line 150 between the zero and the ? so that the line reads 'PRINT#2\$200-1000:GOTO 100', the program stops with no error code, simply the message 'at line 100'. Why the machine prints at line 100 with no error code is a new mystery to me. I find that the Master does this reasonably regularly and wondered if you could offer an explanation.

LINE 80 reads LDA #1000, SCF:0 1/2 which will only give you the byte zero if you put a 1 before the SCF:0. This is because it is impossible to put a value larger than 255 (FF) in the accumulator (A).

The program stops by using the LMC command to store the string you want to print at the location pointed to by '1000-A'. So, using indirect addressing (LDA(\$100)) each character in the string can be read.

The definition for each character is then obtained with the CHARNO (BFFF) 10 command and stored at SCF:0 onwards. The character number for this call is placed at BCF:1, at the start of the definition buffer.

The next section of code turns each character on its side by shifting each bit of a row into a column of the definition of character number 255. Character 255 is then printed followed by a down and a left to position for the next one.

The use of character 255 is why you got a line down the side of the screen (Char 255 is a solid block). As it stood, the program was not converting the definition property. The LMC command uses the vector \$200-\$2FF to point to the service code, normally bad command.

Your second point, concerning the 'at line' with no error code seems to be due to the program being at fault.

Usually, if the no error code situation only crops up when using machine code routines from within programs.

If the machine code does something unexpected, the Basic interpreter generally hasn't got a clue as to what has caused the error and so, cannot assign an error message to the fault.

For example, if you run the sideways program so that it sets up the LMC command the 10400-840 (set an R71 command in), and then GOTO 100, you'll find the no error situation occurs since the machine code is doing something rather unexpected.

Incidentally, if I try taking the colon out of line 150 then I get a syntax error at 150. This could point to a difference between the 128 and the code BBC is.







# WALLET FRIENDLY SOFTWARE

★ AMSTRAD PC1512 ★ IN STOCK NOW

- SWOPPER £19.95** — Easy to use task swapping on a 128k QL
- Only uses 0.5k plus screen storage
  - Simple "Hot Key" operation — no menus
  - Fully automatic task loading & set-up
  - Instant swapping/stoppage preservation
  - Easy to follow comprehensive manual
  - 128k QL: 1 Page prog + Basic
  - 640k QL: 7 Page prog + Basic
  - Permanent access to Basic
  - True multitasking
  - Enhanced Basic (BASIC) command

**MICRODRIVE COPYCAT £10.99** — Strictly not for pirates  
Copies many protected programs. Sold subject to legal view. Very good value.

**BOOT 128k £5.99** — the universal QL "think" program  
Enables an expanded QL to run programs that won't normally run with extra RAM. Just insert in MOV1, heat your QL, wait ... and run your "fussy" software.

**1 to 1 DUMP £5.99**  
Enables you to obtain true hard copy with 1:1 aspect, with using Epson FX80.

**MICRODRIVE TOOLKITS**  
Read and write microdrive sectors and read files from your own Basic or assembly language programs. Full details of microdrive format in comprehensive manual.

BASIC EXTENSIONS ..... £9.99  
ASSEMBLY LANGUAGE ..... £19.99  
BOTH ..... £29.99

**MEDIC OWNERS:** Add 266k for CT9, 3.5" drive (£19)

**DEALERS:** Wanted for our range of QL software including the Computer One products included in this advert.

**COMPUWARE**

ST MARTIN ROAD,  
BIRMINGHAM, BIRMINGHAM B1 1TA  
Tel: 021 627 6144  
Telex: 266674 Comp Com  
Fax: 021 627 6144

PRICES INCLUDE VAT AND DELIVERY  
EXPORT ORDERS WELCOME: WRITE FOR TERMS

computer ONE

Software for the QL

A collection of quality software packages available directly from COMPUWARE



PLUGAL £29.95  
NORTH £29.95  
ASSEMBLY £29.95  
MONITOR £24.95  
THINKING TUTOR £29.95

Illustration by PETER PEAR

Name: .....

Address: .....

Please send me: .....

..... I enclose £ .....

## LIBERATION!

for all QL users



**Liberator Release 3**

- THE DEFINITIVE SUPERBASIC COMPILER
- Many unique features
  - New faster compilation and linker routines
  - Over 200 compatible front end
  - Create your own toolkit of resident procedures with full access to parameters
  - Built-in useful new commands: error trapping, channel sharing, FILES and TOTAL compatibility
  - FULLY CHARGE ON 128k QL
  - Detailed complete option

Available on 128k, 256k disk and 300k on ROM  
Coproducts from Rel 1, 2 and 3: £14.95

**£59.95**

## ESSENTIAL SUPERBASIC TOOLS

**QLOAD** QUICK LOADER FOR SUPERBASIC  
No more time for setup of two while your SuperBASIC program is loading! With QLOAD, absolutely any BASIC program can be loaded within seconds. Full portability across systems and none of the restrictions associated with similar products.

**QREF** REFERENCE CHECK REFERENCE UTILITY  
Find indispensable procedures given you instantly, sorted into reference lists of one or more procedures, functions, variables or machine code routines. Plus a QLOAD function for the SuperBASIC editor. QREF and QLOAD are supplied together as one file for only £44.95 for 128k disk.

**£9.95**

Prices include VAT & P&P in Europe. S&P for many 80/100k, 128k orders: charge the credit. 25, Box 442, Northwood, Middlesex.



**Liberation Software**

## FRONT PAGE



THE QL DESKTOP PUBLISHER

**CAP SOFTWARE**  
17 ST. JAMES'S TERRACE  
DUBLIN 8, DUBLIN  
01-552-3432

FRONT PAGE was compiled using QL LIBERATION  
Version 1.00 - six text and graphics - unexpanded and expanded QL - dots, flip, fill, run - fill printed - edges - (insert text - all QL text styles - cut and paste - text and text correction - alternative character set - double print - print option - set design - Quick compatibility printers - line drawing - all included as standard

"A previously exciting product and incredibly good value" (QL World 1/87)  
"One well designed and useful software" (Computer 2/87, 12/87)  
"A fine desktop program" (Popular Computing 1/87, 5/87)

	PRICE	WISA
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95
FRONT PAGE 1.00	£29.95	£29.95

FRONT PAGE CAP SOFTWARE £29.95 per copy  
For discounts on software, plus newsletter, ring or write for details.

Prices include postage within Europe. Please add 0.50 per item outside Europe. Payment for export orders by Girobank or cheque drawn on a U.K. bank. Otherwise add 0.50 for clearing charges.



# POPULAR Computing WEEKLY

**SPECIAL**  
supplement

1987  
8-14 May

## THE SINCLAIR QL

### INSIDE

23

News of new software releases from third party developers

26

Desktop publishing and printer fonts to turn your QL into a newsroom

30

The QL as a graphics station: ICE and CAD



packages reviewed

33

Exclusive review of Digital Precision's IBM-type keyboard

**N**ever forget, wise computer owners say, that the QL, for all its faults, was the first affordable 68000-based micro. Apart from the Amiga, it is still the only 68000-based micro offering true multi-tasking, the Atari ST doesn't.

Support for the QL, then, is still strong, from users and a small number of third party software and hardware manufacturers.

In this supplement we're looking at Digital Precision's replacement keyboard - IBM quality for your QL. We also have an exclusive preview of the desktop publishing software package, which combines power with ease of use.

CAD software from 3x Micro micro, and Edwells's advanced mouse systems, among many others, go to prove that the QL is far from obsolete. ◀



### NEWS

### WIFEY

**H**ousewife is a housekeeping program from DWF Software. A real housekeeping program. Nothing to do with computing utilities. With QL Housewife, you can make up a personalised shopping list based on your usual shopping habits, and score a choice of three recipe programs, for starters, main courses and desserts. You can name any number of guests from 1 to 20, and you will be given the recipe of your choice with the correct quantity of ingredients, all quantities in metric and imperial, cooking temperatures and an option to print out.

Obviously a menu-driven program! Housewife is cost \$1.99.  
DWF Software, 11 Pines Close, Bramley, Brent HA32B 5BL. Tel (01246) 881201. ◀

### REVIVED

**P**DOE Software of Birmingham is still adding programs to its list, and now has over 25.

Recent additions include Luxurus, a disc recovery program which operates on all or any lost files (and not only, as the scholarly might perhaps expect, on Fortis), J26, and an invoice generator for £30.

Cash Tracker, a debugged, extended and speeded up version of the original Spout Cash Tracker, is now available to new users at £80 as well as an update to registered users at £20.

Name And Address is now available on disc as well as microcassette, in standard Archive or ArchiEM versions. The prices:

feature of this popular program is a "secure" procedure allowing data to be backed up easily before the changes are finally saved.



PD04, 49 Frederick Street, Birmingham B4 3JH. Tel. 021 233 2042. ◀

### TURBO

**A**thens Consultants has produced a program which re-configures Quill to speed up the course, which, along with other small changes, effectively speeds up the whole program and - no small matter to anyone writing more than the old letter - increases work throughput.

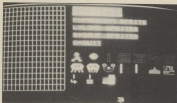
QL TurboQuill costs \$15 and can be ordered from Athens Consultants, 55 Holly

Grove, Farnham, Surrey, who can also provide more information about the program. If ordering, please quote the version of your Quill so that a matching TurboQuill version can be provided. CONFIG...BIB does not work with TurboQuill, so all the default parameters of Quill have to be set up before the turbo program is applied - but the increase in speed is well worth this minor inconvenience. ◀









Sound Toolkit

## SMILES

**S**ailing Software is still offering reduced prices on a range of software, including Sound Experimenter at £5, from Toolkit at £5, Game Toolkit at £5, the Complete Toolkit (the two Toolkits mentioned plus Character Toolkit) for £10, and the machine code "subverted asteroids" arcade game Blots for £3.

Sailing Software, 10 Fir Road, Margate, Stockport SK6 7QX. ☐



Sound Experimenter

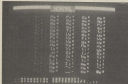
## CHAR-ED

**C**hared, by Colin Oyle of Vitec Systems, is a font editor program designed as a utility to work with Toolkit II. The Toolkit ROM allows SuperBasic users to select character sets other than those built in the QL, as well as altering the pixel block size of characters. Chared, in addition to Toolkit's own facilities, supplies extra pre-defined character sets, the creation and editing of new fonts, printer designs and use of new creations in SuperBasic programs.

The program is designed to be easy to use, with a system of menus and prompts

such that the user can learn to manipulate it quickly without continually turning to the manual sheets, which can then be clipped away in the QL Users Manual for reference on the predefined character sets when needed. Re-defining characters and overcoming the limitations of the QL's character grid is covered in detail.

Case Electronics is also offering the Toolkit II of EPROM, and Liberator Software's QLiberator Basic compiler together for £74. Case Electronics, 880 St. Albans Road, Garston, Warrford, Herts WD12 8SQ. Tel. (0432) 672102. ☐



☐ Char-Ed is a font editor program designed as a utility to work with Toolkit II

## GROWTH INDUSTRY

**S**uperplant sounds like another unlikely comic character, but it is, in fact, a company which writes software on plants. Tony Hird, a professional gardener for twenty years, found that his customers asked him such complex questions about plants and gardening that he began to feel that he needed a computer to answer them all. He was then inspired to write a series of data banks, based on the XChange Archive data base package, which would give advice on the choice and care of plant groups.

The five databases on far corner wild flowers for the garden, fruit trees and bushes, house and office plants, trees, shrubs and climbers, and flowering garden plants, beside information about habitats, plant characteristics, soil types and plant needs. Mr. Hird, who has a keen interest in conservation, has included notes about plants which are attractive to wildlife, and trees and hedging shrubs useful for planning environmental improvements.

The databases can be bought as a complete package for £29.95, any one of the programs with the basic gardening module for £11.95, and an additional package for those who already have the basic gardening module for £5.95 each. The programs are available on microdrives in a choice of 3 1/2 or 5 1/4 in discs.

Superplant software, Mangethe Nurseries, Mangethe, Tregaron, Dyfed, Wales SY23 6SP. Tel. 087 423 213 (from 18.00 to 19.00). ☐

## LUCKY BAG

**P**yramide Software is starting to release a library of cartridges featuring all kinds of useful programs, programming tips, mini utilities, routines and games sent in by professional and amateur QL users, particularly in SuperBasic. Called Bag of Tricks, the first two volumes contain respectively a character set, PEEKs and POKEs, a screen compressor, a basic version of Pacman and various utilities (volume one) and a set of routines for tracing files, drives in use and free memory space, some games, some Graphic Toolkit routines, and more utilities (volume two).

Information about Bag of Tricks, and about submissions for future volumes, from: Eto Promotions Ltd., 28 Waverley Grove, London W3 7PX. Tel. 01-349 2764. ☐



# PUBLISH OR BE DAMNED

AN EXCLUSIVE REVIEW OF DP'S DESKTOP PUBLISHER BY HELEN ARMSTRONG, AND RON MASSEY ON HALLMARK'S Q-WRITER FONT-CREATING PACKAGE

**P**ut simply, the purpose of a desktop publisher is to provide text and illustrations, arrange them to make a presentable page, and allow that page to be printed. It must, at the very least, be a step up from a typed page with a photocopied doodle. I would say that the minimum step up implies graphic options, justified and unjustified column layouts, and a choice of headline characters in adjustable sizes. After all, you can do a helluva lot with a good typewriter, a photocopier and some Letraset.

**Desktop Publisher** requires a 256 memory expansion, and incorporates twelve graphics (headline) fonts and eight Q1 text fonts as standard. There are 100 integral graphic symbols (including a choice of trees, for arborophiles) and 100 pointbreaks option. What this latter means in reality is that you can use any of the graphic symbols as a pointbreak, as well as the standard shapes. The way is paved for an almost boundless supply of backgrounds, borders and patterns. The decorative fonts are proportionally spaced, but all character proportions can be redefined horizontally and vertically, pixel by pixel, and characters/ascenders lengths altered. All characters and graphic fonts can be merged with AND, ORL, and XOR options. Inverted, white or partly, mirror-imaged, boxed, inverse boxed (wholly or partly), magnified up to 15 times in either size (this includes the cursor path), striped or stippled, and rotated through steps of 90 degrees (sorry, no 45s . . .).

## Extra fonts

The program travels on two cartridges which may well carry a few extra fonts. Extra fonts can be imported. **Desktop Publisher** will load any ASCII file, plus quill files with non-ASCII characters, in fact, say the programmers Cliff and Andrew Anderson, anything which can be translated into an uncompressed mode. All fonts can be edited, or adjusted letter by letter during makeup.

Text can be justified pixel by pixel, which allows for very accurate placement of annotations on drawings (horizontally,

vertically, sideways or even upside down) and carefully spaced text. Text can be justified, ranged left or right, or centered, made bold, italicized to the left or the right or inverted. There are four different styles of underlining, including double and single, vertical and horizontal ruled lines and boxes, columns of any width, variable-line feeds on screen, and window-governed cut, copy and paste over both pages. Not only does the page scroll, but the contents of any window scroll as well. The program is completely compatible with Quill, and performs the full range of editing functions on Quill texts. DP's preferred method of generating outside text and graphics, of course, are their own programs **The Editor** and **Eye Q**, which I'll be having a brief look at. Text can be generated inside the program, and in the smallest text size and maximum line feeds (without actually overlapping)—each page can handle up to 16K characters. A full page of word stores in about 160, or one microsecond.

As well as generating patterns and line graphics, **Desktop Publisher** includes clip art for punching, and can import graphics from various sources including **Excel** and (if you have one) via a digitizer, at fully editable.

There are four different styles of screen cursor (partly for accurate editing, partly for fun), and a two-course vertical ruler appears on the main screen. A calibrated green grid can be called up. The working area scrolls and paste, and can be joystick-controlled.

Access to designer screens is fully hierarchical, and any user who 'gets lost' or performs a wrong command inside the editing levels can get out safely and quickly via the esc key without damaging the work or causing the program to lock.

Naturally, DP's pride and joy, the **Turbo Superhacker Compiler**, was used in writing the program, and Cliff said "We had to insert great long loops in places to stop the program from moving too fast for people to feel comfortable with. And then Freddy brought us the Turbo update, and we had to put even longer loops in." More important even than speed, in my mind, is



the very complete set of status reports, along with the font/graphics menus and instruction menus which are displayed to the right of the working area at all times. Although the program is fully menu-driven, nearly everything can be done with single keystroke commands instead. The cursor can be frozen, and snap lock is indicated on screen.

**Desktop Publisher** supports two paper formats and four different print routines, printing A1 and landscape in both landscape and portrait, with vertical and sideways printing options for either. The printer driver is as usual directed towards Epson compatibles, but is reconfigurable for most other suitable printers (ie, not daisywheel) in both serial and parallel modes, and with multiple pass printing up to five times for a sharper finish.

The two packages which are being offered alongside **Desktop Publisher**, **The Editor** and **EyeQ**, have already been around for a while. DP states that **Desktop** does not require either of these programs to operate but, obviously, the dedicated programs have more facilities than integral custom designers.

**Eye-Q** by itself costs \$29.95, and is a freehand, box/outline-based style graphics generator. The basic functions are pointbreak, airbrush, erase, fill, and outline bands in circle/ellipse, line/arc or rectangle/box. Operation is by window menu and by single keystrokes - a great many functions can be performed on the graphics screen by the latter. For instance, the size of the cursor (and therefore of the pointbreak) can be changed using CTRL-W, CTRL-T allows the typing of text characters over the graphics screen in various different modes, and the program incorporates a font editor.

Screens can be saved whole or in part





(window selected), compressed or uncompressed. Screens and fonts can be saved to Basic as well as to storage media, and with any extended QL more than one Eye-Q can be run at a time.

Status information is displayed on an administrative status line at the top or bottom of the screen.

The Editor, now £29.95 (\$39.95 for the expanded QL version) is a not-a-word-processor. It is a text generator which can handle any kind of text file, document, program, as well as a range of special characters for handling ASCII and control commands as if they were normal text.

The great advantage of The Editor, apart from its flexibility of application, is speed. The advance did not suffer by users waiting for certain wordprocessors (including the venerable limited PCW, much used in this office) to scroll through, delete or move blocks of text is not a problem.

The program does not impose its own format on the text, except as the user specifies, and no 'control' data travels with the output, which is then clean to be handled by another formatting source, such as Desktop Publisher. Files can thus be generated for final embellishment elsewhere, or brought in from other WPs (Quill in particular) for bulk alteration and reformatting.

At the moment, Desktop Publisher will not take photographs or make the coffee, but they're working on it. It certainly will do almost everything you want from a DTP package, and in conjunction with Digital Precision's other programs forms a very impressive system. ■

Price: £49.95, with Eye-Q £144.95, with Editor £184.95, with both £129.95. Suppliers: Digital Precision, 222 The Arcade, London E4 9SE, 01-527 5485.

Usable as either a stand-alone program or as a background job serving a text editor, the current edition of Q-Writer is supplied with two distinctive font styles and in two configuration versions on one master microdrive cartridge.

Users of QLs without RAM expansion can configure the main program module so that only one or two selected fonts are held in memory at any one time. Fonts are loaded with the **N1Q...LOAD**

**drive...fontname(font...number** command. Whenever a new font is loaded using a current font number, the previous font is unrolled.

Alternatively, users of expanded machines may opt to use the special main program module, with eight of the fonts built in, and may load up to a total of 81 fonts at any one time, each of which is identified with its own number code.

Switching between fonts is done by using appropriate codes and can include any other printer control codes supported by the Q-Writer system.

Printer commands are initialised with Q-Writer's post-emulation mode by adding a line to Quill's or The Editor's last program: **N1Q...LSE** **drive** (see *os par*).

Changes of typeface in SuperBASIC are made by sending *ctrl* control codes to the printer, initialised by the number two. Starting a particular typeface, such as Q-Writer's Roman font number five would be done by inputting, in SuperBASIC: **openrd**, **N1Q5**.

All subsequent font changes are made by prefacing the font number required with the number "2". Typically, a command from SuperBASIC for changing from one font style to font four, a particularly good Gile English typeface, is made by inputting: **Printw**, **chr(2);chr(4)**.

If used with an extension toolkit supporting EFIT, font styles and any of the printer control commands supported by Q-Writer may be sent to the printer from SuperBASIC by prefacing a block of text in a particular typeface with the command: **Printw**, **2;font no**.

Users of The Editor can produce an equivalent control code insertion in a block of text by inputting characters **<CTRL>**, **<SHIFT>**, **<C>** (producing The Editor's own character "T", with an over-voice [2;font no], followed by any other Q-Writer control characters required.

Other commands supported directly

by the Q-Writer system include codes for the printer bell (7), tabulation (8, plus two additional numbers indicating tabulation spacing), form feeds (11), select and deselect proportional printing (25 and 18, respectively).

Q-Writer's definition of unproportional spacing is that, when selected, the spacing of each character is equal to the widest character in the font. Selecting and/or font exactly the unproportional spacing option selected by a previous font.

Of particular interest is a facility for selecting and deselecting character space out (13 and 16, respectively) and another facility for selecting either normal width or double width (15 and 14, respectively). The latter facility produces a typeface with increase of 25 times that of the normal width.

Q-Writer's fonts may be used with any Epson compatible printer either directly from SuperBASIC or from within text-management programs such as Print's Quill or Digital Precision's The Editor.

The only real limitation encountered with Q-Writer is that, if two or more jobs are running concurrently in the QL, they will remove all data from the

in the right is roman

this English roman

Expanded style English, left; again that

Expanded font set at two 81

Expanded Data Font

Expanded Data Font, with space 24.

N1Q quies, sometimes producing unpredictable results.

An omission from review copy of Q-Writer is that it did not include a font editor for users having particular font or special symbol requirements.

although Ballmark have promised to provide a character editor for Q-Writer within the next three or four weeks.

A well thought-out, easy to get on with program, my only criticism of Q-Writer is its rather minimal documentation. Of its nature, Q-Writer is not a difficult program to get to grips with, quite the contrary. But, as with so many programs of this type, it is easy to overlook useful applications. ■

Supplies: TE Computerware, Stone Street, North Stafford, Ashford, Kent CT25 6DF, 0202 81 2801.





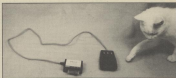


1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26



# COOL LOOK AT CAD

Eidsoft's ICE has become such a standard fixture for serious QL users that not a few of us would have to think twice if the machine beeped up first thing in the morning without the device in the right hand corner. Icon Controlled Environment, for the information of the others, is a WIMP-style icon-driven front-end program which allows you to LOAD, FORMAT, COPY, RENAME, etc. etc. your files without having to type out "mefil..." and the rest every time. The lazy/wealthy person's command list. ICE is installed in a plug-in ROM cartridge, so it boots virtually automatically, and it supports a variety of other icon software such as ClickIt, which allows the way multi-



EIDSOFT'S WIMP SYSTEM AND RUBICONS VIEWPOINT USE THE QL'S GRAPHICS IN DIVERSE WAYS. DENNIS LEEK ASSESSES THEIR STRENGTHS AND WEAKNESSES

tasking, among other things, and ICE ClickIt, which incorporates ICE features in your own programs, all at a reasonable price.

Last year Eidsoft consolidated ICE's usefulness by bringing out a mouse-controlled version, along with two grades of mice. Icon-driven means are ideal for people with a steady hand and no keyboard skills. Being the opposite, I generally prefer not to use them, but since you are committed to icons or indeed anything which can't be set up by single-keystroke commands, a mouse is a godsend.

The ICE mice have the basic ICE system already installed in the interface,

an alternative to buying the mouse and fitting it to a previously owned ICE. There are two versions, the Mouse II around \$40 and the "Jolly ball race" Supreme Mouse at around \$80. Both our samples worked pretty well, especially considering the adverse conditions on my working surface, which is not usually configured for mice.

Having tested the mice on ICE and ClickIt, and quickly getting used to moving the cursor around via the desktop, I went on to try out Eidsoft's AutoICE freehand graphics package. It was here that I had my first grouse with the handbook which, like many other user documents, is perfectly clear if you know in advance what you are supposed to be

**T**hree three-dimensional computer aided designs for the Sinclair QL" says the subtitle on Viewpoint's smart black and white packaging. Elsewhere in the comprehensive handbook, it reminds you that it makes sense to plot out drawings of any complexity on graph paper first. Apart from the neatness of the final output, CAD packages are only an advantage if they are flexible enough to make real savings in time and trouble. Viewpoint's handbook takes considerable care to orientate the user so that, without contracting any false sense of security, I found that I could start screen drawing without tears.

As it was a while since I had used a CAD package, I went for the demo first. Pressing F gave me a blue wire frame cube with the x, y and z co-ordinates in yellow and red. I wasted time trying to remember what x, y and z meant, but once I dropped that and did as the instructions told me, I found that it was easy to rotate, zoom in and zoom out around the cube in larger or smaller jumps.

Using ALT with the cursor keys gives much larger increments, but with the alphanumeric keys it stops any further

progress, so that rotating can be done in large jumps, and zooming in slightly more modest steps. I hit enlarged the cube right off the screen, and then had a tedious job on my hands to bring it back again before I had realised that I could zoom it much faster by using F. All the movements can be repeated by holding the keys down. Reconstruction of a complex drawing after each movement in mode 8 graphics is by no means slow, but it becomes tiresome if you are doing a lot of manipulation, so the screen can be toggled to mode 4, where redrawing takes place very quickly.

The second demonstration is a set of spherical polar co-ordinates which can be tumbled about to get a clearer picture of what different axes and co-ordinates mean in practice.

Conventional screens can appear either in VIEWPOINT mode or in entry mode, and can be toggled (from entry mode only, although it affects all other screens) between mode 4 and mode 8 graphics. Entry mode accepts the instructions which build up the figure. For simple three-dimensional shapes this is easy: the program provides a number of standard shapes—box, circle, sphere,

rectangle, line and a polygon with any number of sides between 3 and 10. There is also a mirror image command which speeds up the building of symmetrical forms, but must be treated with caution if you don't want to end up with a mirror image in the wrong plane - and although there is an immediate delete function, I haven't yet succeeded in "unshining" a mirror image.

Other commands which speed up drawing are Join, which joins two numbered co-ordinates with a straight line, and Search, which enables co-ordinates to be accurately "grabbed" and identified in the lower left hand subwindow (and also identifies the real whereabouts of the cursor, which by the very nature of the process is quite easy to lose track of).

Other commands display a set of eye axes over the drawing, or alternatively superimpose a calibrated grid in the same plane as the cursor. (Translate moves the whole drawing along one of the axes, and Rotate) moves the cursor instantly back to the screen centre, which can be an essential move if another manipulation has moved the cursor suddenly off-screen. Write text() allows text to be overwritten on the drawing. The text does not become



doing. The quibble, for instance, that it isn't entirely clear WHICH of the three programs prefixed EDIT you are supposed to operate can be answered by saying that only a nobody would run the wrong file. But a user book should guide even a nobody through a loading sequence without confusion. Throughout the rest of the manual, too many steps are referred to vaguely or out of sequence.

The mice replace manual KIC's double-click/single-click operation with the centre/left hand buttons on the mouse. In ARICE, the left hand button is used only to change the ink colour during drawing.

The QL's processing power means that it can handle complex graphics quickly. The mouse enables quick and accurate (depending on how steady your hand and eye is) freeshoot cursor movement. Loading ARICE puts you straight into a black screen with a topaz-sized white dot for a brush. This is the experimental screen for new users, where you can practice painting broad strokes while scrolling through the ink colours using the right hand mouse button, and turning the ink on and off with the left one.

However, these are the only two choices which can actually be made within the drawing screen. All other changes have to be made through the main menu, which entails much cursor shifting and clicking to and fro, which slows down the whole process. To take a simple example,

doing a 'click on a point' scribble, the 'SET' function has to be reselected from the main menu for every change of ink colour.

Using the crosshair brush, the colours can be changed pixel by pixel. The x7 screen magnifier is helpful here, but it can be done on the full screen if you have patience and good eyesight.

As well as plain ink (the usual eight colours in mode 0 and four in mode 1) two colour effects, airbrush and stipple/stripes can be obtained from the menu. Airbrush simply gives a random stipple in the track of the brush, with a choice of five stipple densities. The 'SE' menu (which does give you visual indicators of which ink colour you are changing to - you just have to go through two menus to find it) allows a choice of plain, or any two colours mixed in regular stipple or one-pixel bars, plus their inverses.

Following the last operation is done via the Undo menu, a window which appears on the drawing screen when the main menu is selected by pushing the middle button on the mouse.

BEOLC (our) allows changing of all or any of the colours over the whole or part of a screen. Selecting a part of the screen is done via cursor-set pull down windows. This is useful for altering one colour in a small area, such as the colour of a piece of text. Unfortunately, the process is made more cumbersome because an

'alternative' colour has to be selected for all eight colours every time BEOLC is used, even where only one colour is actually going to be changed.

COPT allows areas of the screen to be freely transferred, duplicated and saved individually as files for future use. This includes an ISHOW function so that you can discard one colour, such as an unwanted background, from a block before you move it.

The manual refers several times to the fact that ARICE uses all the available memory on an unexpanded QL, but (in fact not withstanding I would still have liked to see some status information, for instance, ink number and a y's cursor position, as the drawing screen to save a lot of clicking and error-leaping about.

Fast graphics, slowed down by the select procedures - but I still found ARICE enjoyable and straightforward to use, even though the manual is like a finger puzzle. (The manual index gives eight entries, all concerning the mouse, in the first three pages, and only two entries for the other mouse pages). And at \$14.95 it is good value and an attractive addition to ICE and the WICE. There is also the non-mouse version with only minor differences to the mouse one - ideal if you have a talent for drawing curves with the cursor key! **■**

Supplier: **Edcraft, The Office, Hall Farm, North Enderby, Upminster.**

part of the drawing, but remains (and prints out) at the screen position where it was entered. It can be removed wholesale by CTRL W, but not edited.

Colour is displayed by the cursor, and the colour of the next piece of the drawing to be laid down can be reselected at any time via function key I and a menu. There is no colour fill function, and generally I found the colours more distracting than helpful on complex drawings. They considerably helped to establish perspective - this is a matter of personal taste.

Colours already laid down in either mode can't be deliberately changed (although switching modes automatically causes the usual changes). Indeed, once it is on the screen, nothing further back than the last command can be altered without re-starting the entire drawing. D+del) removes the last operation (this is effectively limited to the standard library shapes and the join function), but CTRL D removes the lot, and the user's manual freely reminds the user to save the drawing regularly.

Solid three-dimensional figures (as opposed to wire outlines) are achieved by hidden line removal using back surface



elimination, which only works fully for simple convex polygons. Counting the vertices and storing the co-ordinates is a tedious process, but once this is done the hidden line function can be toggled. According to the handbook, a cheese is a single convex polygon and a jet aircraft isn't, so the hidden lines work less well for more complex drawings. Hidden lines can be selected, viewed and saved by stages, which assists in reaching the desired effect without fudging up.

Finished drawings can be saved as three-dimensional co-ordinate files, and printed out as they appear on the screen from the SE menu. A reasonable amount of information is given on printer control codes in the handbook, with examples for

Epson codes. On-screen images can also be saved to a machine code subroutine for use with other Superdaisy programs, and detailed instructions are given for doing this.

Viewpoint is not a professional CAD package. There is no facility for devising your own library shapes for inclusion in other drawings, and the grid calibrations are not accessible to the nearest micron; boom from my electrical drawing department, and serve him right for being a cheapo, because you can't buy that sort of package for less than several hundred pounds.

Viewpoint is very neat and tidy, the screen resolution is good even on my low-resolution screen, and the handbook has been written with great thoughtfulness and as far as I can see very few and very trivial mistakes.

This original version of Viewpoint from November 1985 is loaded into a permanent memory position, but Edcraft tells me that there is a newer version which will also alongside other programs in the QL's memory. **■**

Price: Cartridge \$19.95, disc \$29.95.  
Supplier: **Edcraft Micros, 11 Banstead Road, Shefffield S7 2BA.**



AT LAST!  
A REAL KEYBOARD  
FOR THE QL  
**THE RAINBOW  
KEYBOARD**

A PROFESSIONAL 'FEEL', SEPARATE  
KEYBOARD WITH 81 FULL TRAVEL  
KEYS INCORPORATING CURSOR AND  
NUMBER PADS. SIMPLE TO INSTALL.  
FULLY COMPATIBLE WITH ALL  
SOFTWARE.



**£89.95 inc. VAT**

PLEASE ALLOW 28 DAYS FOR DELIVERY

Special offer Rainbow Keyboard and Digital Precision Taster £175.00

**QL REPAIRS**

FROM £17.95

Phone for quote

**BATTERY BACK UP FOR REAL TIME CLOCK**  
Maintains the date and time while the  
QL is off

KIT £19.95

FITTED £26.95

**640K MEMORY UPGRADE**

KIT £110.00

FITTED £125.00

Overseas enquiries welcome



**BUSINESS & HOME COMPUTER REPAIRS**

Clark House, Huxley, York YO3 8HT. Tel: (0304) 338823

**POPULAR**  
**Computing**  
WEEKLY



- Word Processor
- Database
- Spreadsheet
- Graphics

**Subscribe** now to  
**Popular Computing**  
**Weekly** and we'll send you  
your own **Mini Office**  
program **FREE**.

**MINI OFFICE**

— ORDER FORM —

Please enter my annual subscription to Popular Computing Weekly at **£29.95 U.K. £39.95 Overseas** and send me my **FREE** MINI OFFICE program as indicated below.

Send me **MINI OFFICE** for: ☐ Amstrad ☐ Commodore ☐ Spectrum  
☐ Electron ☐ BBC

☐ Please debit my Access/Visa/Master card no. ☐ I enclose a cheque made payable to

\_\_\_\_\_

Sunshine Publications Ltd.

Expiry date: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Return this form to: PCW Sales, 12-13 Little Newport Street, London WC2H 7PP, U.K.



HELEN ARMSTRONG  
REVIEWS THE  
LATEST QL  
REPLACEMENT  
KEYBOARD, AND  
CONCLUDES THAT  
DIGITAL  
PRECISION'S  
BM-TYPE UNIT MAY  
WELL BE WORTH  
THE MONEY



## CHAIRMAN OF THE BOARDS

**T**he QL is a natural for a replacement keyboard - many of its full travel keys seem to have a one-way ticket, the resulting black holes remaining as sharp-edged (pleasant) traps for unwary fingers, transforming the would-be touch typist into a frustrated switch typist.

AEC Electronics's Deluxe keyboard, marketed by Digital Precision, is an extension (rather than a replacement) keyboard. The Deluxe started its design life as an IBM PC/XT device, which means that, with the interface provided by DP, your QL is greeted with a professional quality keyboard.

There are ten function keys to the right of the main keypad, which correspond to F1-F5 and SHIFT F1-F5 on the QL, and are also user definable. On the left of the keyboard is a standard numeric keypad complete with centering flip on the 5. And there is - ah joy - a backspace key which deletes the character to the left without using CTRL. The whole unit is about 28mm high, and there is a pair of strong integral fold-down supports at the back of the base for better keyboard tilt. And they won't fall off.

The key feel is fairly light but not loose or spongy, and no bounce. Trying it for speed, I found that the screen input kept up with the fastest typing speed I could manage, and stopped when I stopped. Freddy Vachita of DP was prepared to be a bit less than a penny, smacking the keyboard vigorously with the flats of both hands a few times. The input got well ahead of the screen, but the buffer coped

admirably and spent the next 30 seconds or so quietly catching up.

"The Deluxe keyboard was a valiant attempt, but it costs thousands just to set up a mould for injection moulding, so they have had to opt for vacuum moulding. Why make the thing yourself when you can buy a high quality, industry standard injection moulded keyboard from someone who already has a production line, and concentrate on the interface?"

Installation is not difficult, but it requires a certain amount of care. Having opened the QL, ribbon cables which connect the present QL keyboard must be disconnected and the ill-forged ROM must be eased gently out of its multiway socket and the new chip carrier, an integral part of the interface, carefully located in the socket without misfiring and bending any of the legs. Once correctly located and driven firmly home, the ROM goes back into the new socket, and the interface becomes a permanent part of the computer. The interface board is designed to fit over and around the present components without bending anything aside, and with or without the aluminium plate under the keyboard in place.

The interface goes through any available port or a purpose-set slot in the case - the ROM port is recommended, as there is a plastic pillar just inside round which the cable can be made fast before fixing the connector in place.

The new lead connects via a 4-pin DIN socket to the corresponding plug on the end of a coiled lead, to the keyboard.

Apart from the aforementioned keys, there are one or two which do nothing (a by-product of their IBM-style provenance). The Sys Req key locks out the keyboard input. A full system reset can't be done from the extension keyboard, as the RESET button on the QL acts directly on the internal hardware. All the QL's characters are supported. Caps lock and Number lock (for the keypad) both have LED OS indicators.

The draft of the user documentation which we saw is well up to normal DP standards of obsessive detail, including instructions for ridding yourself of static before opening the QL, and advice about what to do if an excess of peripherals causes overloading in the QL, including an offer to replace the voltage regulator as a lasting solution. This is sound practice for anyone with a QL or a Spectrum, incidentally, and in the QL it doesn't even require soldering.

DP stresses the Deluxe's full compatibility with QDOS and with all makes of the drives, memory expansions, printer interfaces, mice, etc. With the keyboard which is available in black, as well as the usual beige/grey, they are also giving away a Qiga Basic cartridge.

Despite Sage Systems' plans to launch cheaper QL replacement keyboards, it may well be that if you want the best the Deluxe keyboard may be the one for you. ◀

Price: £89.95.  
Supplier: Digital Precision, 212 The Avenue, London E16 6SE, 01 527 5183.



ATTENTION ALL OL ADVENTURERS! CAN YOU BECOME THE HERO OF THE 'PRINCELANDS' IN THE ENTHRALLING NEW EPIC

## THE HEART OF GERN?

© 1987

The "Heart of Gern" is the first of a challenging series of adventure games devised to test even the most battle-scarred adventurer. Set in the magical fantasy world of the 'Prinzerlands' you must continue the quest for the black jewel which imprisons the evil spirit-wolf, Gern. You must reach the Heart before the brotherhood, an evil cult of wolf worshippers whose aim is to release Gern. Hidden

away in a secret vault protected by guards, traps and magical deceptions it will take more than luck to succeed, it will take skill, determination and above all rational thinking.

Will this be the dawn of a new dark age or can the evil brotherhood be thwarted?

The fate of the 'Prinzerlands' is in your hands.

Now available in four formats:- Microdrive Mode 4 or 5 @ £15.50  
(Please specify format required) 11.5" Disc Mode 4 or 5 @ £17.00



by PCBS

Complete with THE HEART OF THE ORACLE

Send your cheque, PO to PCBS, Studio 361, Newell

Office, Paisley PA1 1JH. Please allow 28 days for delivery. Available soon for Spectrum, Commodore 64 and Amstrad

**CST**

**Cambridge Systems Technology**

**CST**

24 Green Street, Stevenage, Herts SG1 3DS  
Telephone: Stevenage (0438) 552150

Thor 20 Computer Range  
Thor 20 Computer Range  
Thor 20 Computer Range

# 68020

Three times faster

Nowly released this month the Thor 20 and Thor 31 Computer Systems are available at a special introductory price when ordered before 30th June 1987. For full details contact sales on 0438 552150.

**CST**

#### Q1 Expanded

Q101 Windows plate 3.5" or 5.25" (disk) ..... £79.95

Q102 Plus 512K Q1 Memory ..... £139.95

CST Dual 3.5" Cased Floppy Drives ..... £279.95

#### Package A

Q101 + Dual 3.5" Drives ..... £279.95

#### Package B

Package A + Q102 Plus ..... £409.95

**CST**



## Spectrum Rom Calls

Russell Thomas

**M**any of the System Variables are deleted along with 2 editing commands.

### Editing commands

Now something purely for 108 owners. Those extra editing commands available with the keypad can be found on the keyboard. I've compiled a list but if you know of others then let us all know.

23658 FLAG00	POKE 23658, 0-CAPS LOCK ON 0-OFF
23660 DF 52	Size of the lower part of the screen.
23680 S TOP	The No. of the line which will appear at the top of the screen in scrolling.
23670 RAND	The starting point for RAND, its value is set by the RANDOMISE command.
23672 FRAMES	Three byte frame-counter that counts the number of frames sent to the TV since power up. To POKE a three byte number use the following: POKE A+(5528*P22839+1)+256*P22839+8; where X is the starting address.
23675 P POSH	Redundant (?) column number of printer position. Kempston use this location to set the printing width (row) for their Ceramics II interface.
23681 108495	That's right, it's empty, use it for anything you like.
23682 SCR CT	Scroll counter. If you want to stop "scroll" being printed, use: POKE 23682, 255 in your main loop.
23728 YOURSG	Another empty line, although only due to a nice little bug in the Rom.
23736 TAP4	Not really a 0V although POKING it with 10h prior to saving a program, stores the start tape message and instantly saves the program. Great for saving blocks and blocks of data.
Worth a mention:	MAP-PROG=PROGRAM LENGTH

POKE GRAPH MODE, 08=ORMS SHIFT, 04=STANDARD MODE)	
04 F	move to top of last page
04 A	move to top of first page
04 S	move to end of current line
04 P	move to start of current line
04 Z	switch screen format
05 I	move down half page
05 W	move to end of current line
05 W	delete to end of current word
05 E	delete previous word
05 K	delete from cursor to start of line
05 T	move to top of last page
05 I	move to previous word
05 J	delete from cursor to end of line
05 R	move to top of first page
05 P	move up half a page
05520	move to start of line
05520	switch screen
0552 J	move to start of next word
0552 K	delete char under cursor

Some of these commands allow you to over-ride things as far. The manual is incorrect when it says you will not be allowed to leave an incorrect line. For instance, if you have

just deleted half of a perfectly good line, if you use 05 R and then return, your original line will still be there! This can work the other way around of course, if you have just

edited out a bug in a line and fail to press enter and use 05 R instead, your entry will be forgotten and your old line put back.

## PROGRAMMING: C64

### Expanded Characters

Robin Davies

**W**hen displaying text on the Commodore 64 you are stuck with a standard 8x8 character set. The

following routine will allow you to print text at double width, making each letter 16x16 pixels wide. The program is written entirely in Basic so adding it to programs of your own should prove to be easy.

```

10 REM EXPANDED CHARACTERS
11 REM POKE$3272,21 : NORMAL CHARACTERS
12 REM POKE$3272,23 : EXP CHARACTERS
13 REM
14 A=53240 : REM HIGH POKE LOCATION
15 B=1924 : REM TOP SCREEN LOCATION
16 C=53276 : REM TOP COLOUR LOCATION
17 POKEA+32,0 : REM BORDER BLACK
18 POKEA+33,0 : REM SCREEN BLACK
19 PRINT"ESC" : REM CLEAR SCREEN
20 POKEA+24,23 : REM EXPANDED ON
21 REM
22 REM NUMBERS BELOW ARE CODE NUMBERS
23 REM FOR THE LETTERS (340, 240 ETC.)
24 REM
25 DATA 85,24,16,81,14,85,84,32,83,85
26 DATA 81,10,81,83,28,85,18,13,32,84
27 DATA 85,13,15,32,85,15,15,32,32,32
28 DATA 16,40,83,40,23,40,32,82,25,32

```

```

29 DATA 16,15,82,87,14,32,84,81,22,89
30 DATA 85,17,32,85,15,18,32,25,15,21
31 REM
32 D=0 : F=12344
33 FORD=1TO2 : REM LINES TO PRINT
34 FORG=1TO30 : REM NUMBER OF LETTERS
35 POKEI,85 : POKEB+334,I
36 FORH=1TO3 : POKEB+40H+0,H
37 POKEC+G+H+0,1 : C=C+1 : NEXTH
38 NEXTI : POKEB+334,0 : POKEI,85
39 FORH=1TO3 : POKEB+40H+340,H+0
40 FORD=1TO3 : POKEB+40H+F+1 : NEXTJ,H,0
41 POKEI,85 : POKEB+334,I
42 B=B+128 : C=C+128 : NEXTD
43 FORH=1TO30000 : NEXTJ : PRINT"ESC"
44 POKE$3272,21 : REM EXPANDED OFF

```

READY.



## Icon Toolkit

Simon Goodwin

The final instalment in the Icon Toolkit series includes an icon designer. The program allows the user to design 5 icons at a time. These groups of icons can then be merged together to form

a larger file consisting of up to 255 icons. On loading the program a 16 x 16 grid is displayed along with a menu. The cursor is moved using the cursor keys. Pressing the space bar fills a block with the current pattern. Selecting the 5Way turns areas made on or off in areas made pressing SPACE saves the current block. Other menu options allow the user to change the pen or ink colours. Icon designs can also be inverted

or mirrored. Finally files containing 5 icons can be loaded or saved to tape or disk.

To use more than 1 set of 5 icons in a program type:  
10 memory [address-1]  
20 load "set0", [address]  
30 load "set1", [address]+(17520)  
40 load "set2", [address]+(27520)  
The variable [address] can be a number from 385-40555.



```

10 REM .....
20 REM ..... I C O N
30 REM .....
40 REM ..... by Simon
50 REM .....
60 REM .....
70 REM .....
80 REM .....
90 REM .....
100 REM .....
110 IF INKEY(128)=0 THEN GOTO 120
120 IF INKEY(129)=0 THEN GOTO 130
130 IF INKEY(130)=0 THEN GOTO 140
140 FOR pen=1 TO 255:GOTO 150
150 GOTO 160
160 GOTO 170
170 GOTO 180
180 GOTO 190
190 GOTO 200
200 GOTO 210
210 GOTO 220
220 GOTO 230
230 GOTO 240
240 GOTO 250
250 GOTO 260
260 GOTO 270
270 GOTO 280
280 GOTO 290
290 GOTO 300
300 GOTO 310
310 GOTO 320
320 GOTO 330
330 GOTO 340
340 GOTO 350
350 GOTO 360
360 GOTO 370
370 GOTO 380
380 GOTO 390
390 GOTO 400
400 GOTO 410
410 GOTO 420
420 GOTO 430
430 GOTO 440
440 GOTO 450
450 GOTO 460
460 GOTO 470
470 GOTO 480
480 GOTO 490
490 GOTO 500
500 GOTO 510
510 GOTO 520
520 GOTO 530
530 GOTO 540
540 GOTO 550
550 GOTO 560
560 GOTO 570
570 GOTO 580
580 GOTO 590
590 GOTO 600
600 GOTO 610
610 GOTO 620
620 GOTO 630
630 GOTO 640
640 GOTO 650
650 GOTO 660
660 GOTO 670
670 GOTO 680
680 GOTO 690
690 GOTO 700
700 GOTO 710
710 GOTO 720
720 GOTO 730
730 GOTO 740
740 GOTO 750
750 GOTO 760
760 GOTO 770
770 GOTO 780
780 GOTO 790
790 GOTO 800
800 GOTO 810
810 GOTO 820
820 GOTO 830
830 GOTO 840
840 GOTO 850
850 GOTO 860
860 GOTO 870
870 GOTO 880
880 GOTO 890
890 GOTO 900
900 GOTO 910
910 GOTO 920
920 GOTO 930
930 GOTO 940
940 GOTO 950
950 GOTO 960
960 GOTO 970
970 GOTO 980
980 GOTO 990
990 GOTO 1000
1000 GOTO 1010
1010 GOTO 1020
1020 GOTO 1030
1030 GOTO 1040
1040 GOTO 1050
1050 GOTO 1060
1060 GOTO 1070
1070 GOTO 1080
1080 GOTO 1090
1090 GOTO 1100
1100 GOTO 1110
1110 GOTO 1120
1120 GOTO 1130
1130 GOTO 1140
1140 GOTO 1150
1150 GOTO 1160
1160 GOTO 1170
1170 GOTO 1180
1180 GOTO 1190
1190 GOTO 1200
1200 GOTO 1210
1210 GOTO 1220
1220 GOTO 1230
1230 GOTO 1240
1240 GOTO 1250
1250 GOTO 1260
1260 GOTO 1270
1270 GOTO 1280
1280 GOTO 1290
1290 GOTO 1300
1300 GOTO 1310
1310 GOTO 1320
1320 GOTO 1330
1330 GOTO 1340
1340 GOTO 1350
1350 GOTO 1360
1360 GOTO 1370
1370 GOTO 1380
1380 GOTO 1390
1390 GOTO 1400
1400 GOTO 1410
1410 GOTO 1420
1420 GOTO 1430
1430 GOTO 1440
1440 GOTO 1450
1450 GOTO 1460
1460 GOTO 1470
1470 GOTO 1480
1480 GOTO 1490
1490 GOTO 1500
1500 GOTO 1510
1510 GOTO 1520
1520 GOTO 1530
1530 GOTO 1540
1540 GOTO 1550
1550 GOTO 1560
1560 GOTO 1570
1570 GOTO 1580
1580 GOTO 1590
1590 GOTO 1600
1600 GOTO 1610
1610 GOTO 1620
1620 GOTO 1630
1630 GOTO 1640
1640 GOTO 1650
1650 GOTO 1660
1660 GOTO 1670
1670 GOTO 1680
1680 GOTO 1690
1690 GOTO 1700
1700 GOTO 1710
1710 GOTO 1720
1720 GOTO 1730
1730 GOTO 1740
1740 GOTO 1750
1750 GOTO 1760
1760 GOTO 1770
1770 GOTO 1780
1780 GOTO 1790
1790 GOTO 1800
1800 GOTO 1810
1810 GOTO 1820
1820 GOTO 1830
1830 GOTO 1840
1840 GOTO 1850
1850 GOTO 1860
1860 GOTO 1870
1870 GOTO 1880
1880 GOTO 1890
1890 GOTO 1900
1900 GOTO 1910
1910 GOTO 1920
1920 GOTO 1930
1930 GOTO 1940
1940 GOTO 1950
1950 GOTO 1960
1960 GOTO 1970
1970 GOTO 1980
1980 GOTO 1990
1990 GOTO 2000
2000 GOTO 2010
2010 GOTO 2020
2020 GOTO 2030
2030 GOTO 2040
2040 GOTO 2050
2050 GOTO 2060
2060 GOTO 2070
2070 GOTO 2080
2080 GOTO 2090
2090 GOTO 2100
2100 GOTO 2110
2110 GOTO 2120
2120 GOTO 2130
2130 GOTO 2140
2140 GOTO 2150
2150 GOTO 2160
2160 GOTO 2170
2170 GOTO 2180
2180 GOTO 2190
2190 GOTO 2200
2200 GOTO 2210
2210 GOTO 2220
2220 GOTO 2230
2230 GOTO 2240
2240 GOTO 2250
2250 GOTO 2260
2260 GOTO 2270
2270 GOTO 2280
2280 GOTO 2290
2290 GOTO 2300
2300 GOTO 2310
2310 GOTO 2320
2320 GOTO 2330
2330 GOTO 2340
2340 GOTO 2350
2350 GOTO 2360
2360 GOTO 2370
2370 GOTO 2380
2380 GOTO 2390
2390 GOTO 2400
2400 GOTO 2410
2410 GOTO 2420
2420 GOTO 2430
2430 GOTO 2440
2440 GOTO 2450
2450 GOTO 2460
2460 GOTO 2470
2470 GOTO 2480
2480 GOTO 2490
2490 GOTO 2500
2500 GOTO 2510
2510 GOTO 2520
2520 GOTO 2530
2530 GOTO 2540
2540 GOTO 2550
2550 GOTO 2560
2560 GOTO 2570
2570 GOTO 2580
2580 GOTO 2590
2590 GOTO 2600
2600 GOTO 2610
2610 GOTO 2620
2620 GOTO 2630
2630 GOTO 2640
2640 GOTO 2650
2650 GOTO 2660
2660 GOTO 2670
2670 GOTO 2680
2680 GOTO 2690
2690 GOTO 2700
2700 GOTO 2710
2710 GOTO 2720
2720 GOTO 2730
2730 GOTO 2740
2740 GOTO 2750
2750 GOTO 2760
2760 GOTO 2770
2770 GOTO 2780
2780 GOTO 2790
2790 GOTO 2800
2800 GOTO 2810
2810 GOTO 2820
2820 GOTO 2830
2830 GOTO 2840
2840 GOTO 2850
2850 GOTO 2860
2860 GOTO 2870
2870 GOTO 2880
2880 GOTO 2890
2890 GOTO 2900
2900 GOTO 2910
2910 GOTO 2920
2920 GOTO 2930
2930 GOTO 2940
2940 GOTO 2950
2950 GOTO 2960
2960 GOTO 2970
2970 GOTO 2980
2980 GOTO 2990
2990 GOTO 3000
3000 GOTO 3010
3010 GOTO 3020
3020 GOTO 3030
3030 GOTO 3040
3040 GOTO 3050
3050 GOTO 3060
3060 GOTO 3070
3070 GOTO 3080
3080 GOTO 3090
3090 GOTO 3100
3100 GOTO 3110
3110 GOTO 3120
3120 GOTO 3130
3130 GOTO 3140
3140 GOTO 3150
3150 GOTO 3160
3160 GOTO 3170
3170 GOTO 3180
3180 GOTO 3190
3190 GOTO 3200
3200 GOTO 3210
3210 GOTO 3220
3220 GOTO 3230
3230 GOTO 3240
3240 GOTO 3250
3250 GOTO 3260
3260 GOTO 3270
3270 GOTO 3280
3280 GOTO 3290
3290 GOTO 3300
3300 GOTO 3310
3310 GOTO 3320
3320 GOTO 3330
3330 GOTO 3340
3340 GOTO 3350
3350 GOTO 3360
3360 GOTO 3370
3370 GOTO 3380
3380 GOTO 3390
3390 GOTO 3400
3400 GOTO 3410
3410 GOTO 3420
3420 GOTO 3430
3430 GOTO 3440
3440 GOTO 3450
3450 GOTO 3460
3460 GOTO 3470
3470 GOTO 3480
3480 GOTO 3490
3490 GOTO 3500
3500 GOTO 3510
3510 GOTO 3520
3520 GOTO 3530
3530 GOTO 3540
3540 GOTO 3550
3550 GOTO 3560
3560 GOTO 3570
3570 GOTO 3580
3580 GOTO 3590
3590 GOTO 3600
3600 GOTO 3610
3610 GOTO 3620
3620 GOTO 3630
3630 GOTO 3640
3640 GOTO 3650
3650 GOTO 3660
3660 GOTO 3670
3670 GOTO 3680
3680 GOTO 3690
3690 GOTO 3700
3700 GOTO 3710
3710 GOTO 3720
3720 GOTO 3730
3730 GOTO 3740
3740 GOTO 3750
3750 GOTO 3760
3760 GOTO 3770
3770 GOTO 3780
3780 GOTO 3790
3790 GOTO 3800
3800 GOTO 3810
3810 GOTO 3820
3820 GOTO 3830
3830 GOTO 3840
3840 GOTO 3850
3850 GOTO 3860
3860 GOTO 3870
3870 GOTO 3880
3880 GOTO 3890
3890 GOTO 3900
3900 GOTO 3910
3910 GOTO 3920
3920 GOTO 3930
3930 GOTO 3940
3940 GOTO 3950
3950 GOTO 3960
3960 GOTO 3970
3970 GOTO 3980
3980 GOTO 3990
3990 GOTO 4000
4000 GOTO 4010
4010 GOTO 4020
4020 GOTO 4030
4030 GOTO 4040
4040 GOTO 4050
4050 GOTO 4060
4060 GOTO 4070
4070 GOTO 4080
4080 GOTO 4090
4090 GOTO 4100
4100 GOTO 4110
4110 GOTO 4120
4120 GOTO 4130
4130 GOTO 4140
4140 GOTO 4150
4150 GOTO 4160
4160 GOTO 4170
4170 GOTO 4180
4180 GOTO 4190
4190 GOTO 4200
4200 GOTO 4210
4210 GOTO 4220
4220 GOTO 4230
4230 GOTO 4240
4240 GOTO 4250
4250 GOTO 4260
4260 GOTO 4270
4270 GOTO 4280
4280 GOTO 4290
4290 GOTO 4300
4300 GOTO 4310
4310 GOTO 4320
4320 GOTO 4330
4330 GOTO 4340
4340 GOTO 4350
4350 GOTO 4360
4360 GOTO 4370
4370 GOTO 4380
4380 GOTO 4390
4390 GOTO 4400
4400 GOTO 4410
4410 GOTO 4420
4420 GOTO 4430
4430 GOTO 4440
4440 GOTO 4450
4450 GOTO 4460
4460 GOTO 4470
4470 GOTO 4480
4480 GOTO 4490
4490 GOTO 4500
4500 GOTO 4510
4510 GOTO 4520
4520 GOTO 4530
4530 GOTO 4540
4540 GOTO 4550
4550 GOTO 4560
4560 GOTO 4570
4570 GOTO 4580
4580 GOTO 4590
4590 GOTO 4600
4600 GOTO 4610
4610 GOTO 4620
4620 GOTO 4630
4630 GOTO 4640
4640 GOTO 4650
4650 GOTO 4660
4660 GOTO 4670
4670 GOTO 4680
4680 GOTO 4690
4690 GOTO 4700
4700 GOTO 4710
4710 GOTO 4720
4720 GOTO 4730
4730 GOTO 4740
4740 GOTO 4750
4750 GOTO 4760
4760 GOTO 4770
4770 GOTO 4780
4780 GOTO 4790
4790 GOTO 4800
4800 GOTO 4810
4810 GOTO 4820
4820 GOTO 4830
4830 GOTO 4840
4840 GOTO 4850
4850 GOTO 4860
4860 GOTO 4870
4870 GOTO 4880
4880 GOTO 4890
4890 GOTO 4900
4900 GOTO 4910
4910 GOTO 4920
4920 GOTO 4930
4930 GOTO 4940
4940 GOTO 4950
4950 GOTO 4960
4960 GOTO 4970
4970 GOTO 4980
4980 GOTO 4990
4990 GOTO 5000
5000 GOTO 5010
5010 GOTO 5020
5020 GOTO 5030
5030 GOTO 5040
5040 GOTO 5050
5050 GOTO 5060
5060 GOTO 5070
5070 GOTO 5080
5080 GOTO 5090
5090 GOTO 5100
5100 GOTO 5110
5110 GOTO 5120
5120 GOTO 5130
5130 GOTO 5140
5140 GOTO 5150
5150 GOTO 5160
5160 GOTO 5170
5170 GOTO 5180
5180 GOTO 5190
5190 GOTO 5200
5200 GOTO 5210
5210 GOTO 5220
5220 GOTO 5230
5230 GOTO 5240
5240 GOTO 5250
5250 GOTO 5260
5260 GOTO 5270
5270 GOTO 5280
5280 GOTO 5290
5290 GOTO 5300
5300 GOTO 5310
5310 GOTO 5320
5320 GOTO 5330
5330 GOTO 5340
5340 GOTO 5350
5350 GOTO 5360
5360 GOTO 5370
5370 GOTO 5380
5380 GOTO 5390
5390 GOTO 5400
5400 GOTO 5410
5410 GOTO 5420
5420 GOTO 5430
5430 GOTO 5440
5440 GOTO 5450
5450 GOTO 5460
5460 GOTO 5470
5470 GOTO 5480
5480 GOTO 5490
5490 GOTO 5500
5500 GOTO 5510
5510 GOTO 5520
5520 GOTO 5530
5530 GOTO 5540
5540 GOTO 5550
5550 GOTO 5560
5560 GOTO 5570
5570 GOTO 5580
5580 GOTO 5590
5590 GOTO 5600
5600 GOTO 5610
5610 GOTO 5620
5620 GOTO 5630
5630 GOTO 5640
5640 GOTO 5650
5650 GOTO 5660
5660 GOTO 5670
5670 GOTO 5680
5680 GOTO 5690
5690 GOTO 5700
5700 GOTO 5710
5710 GOTO 5720
5720 GOTO 5730
5730 GOTO 5740
5740 GOTO 5750
5750 GOTO 5760
5760 GOTO 5770
5770 GOTO 5780
5780 GOTO 5790
5790 GOTO 5800
5800 GOTO 5810
5810 GOTO 5820
5820 GOTO 5830
5830 GOTO 5840
5840 GOTO 5850
5850 GOTO 5860
5860 GOTO 5870
5870 GOTO 5880
5880 GOTO 5890
5890 GOTO 5900
5900 GOTO 5910
5910 GOTO 5920
5920 GOTO 5930
5930 GOTO 5940
5940 GOTO 5950
5950 GOTO 5960
5960 GOTO 5970
5970 GOTO 5980
5980 GOTO 5990
5990 GOTO 6000
6000 GOTO 6010
6010 GOTO 6020
6020 GOTO 6030
6030 GOTO 6040
6040 GOTO 6050
6050 GOTO 6060
6060 GOTO 6070
6070 GOTO 6080
6080 GOTO 6090
6090 GOTO 6100
6100 GOTO 6110
6110 GOTO 6120
6120 GOTO 6130
6130 GOTO 6140
6140 GOTO 6150
6150 GOTO 6160
6160 GOTO 6170
6170 GOTO 6180
6180 GOTO 6190
6190 GOTO 6200
6200 GOTO 6210
6210 GOTO 6220
6220 GOTO 6230
6230 GOTO 6240
6240 GOTO 6250
6250 GOTO 6260
6260 GOTO 6270
6270 GOTO 6280
6280 GOTO 6290
6290 GOTO 6300
6300 GOTO 6310
6310 GOTO 6320
6320 GOTO 6330
6330 GOTO 6340
6340 GOTO 6350
6350 GOTO 6360
6360 GOTO 6370
6370 GOTO 6380
6380 GOTO 6390
6390 GOTO 6400
6400 GOTO 6410
6410 GOTO 6420
6420 GOTO 6430
6430 GOTO 6440
6440 GOTO 6450
6450 GOTO 6460
6460 GOTO 6470
6470 GOTO 6480
6480 GOTO 6490
6490 GOTO 6500
6500 GOTO 6510
6510 GOTO 6520
6520 GOTO 6530
6530 GOTO 6540
6540 GOTO 6550
6550 GOTO 6560
6560 GOTO 6570
6570 GOTO 6580
6580 GOTO 6590
6590 GOTO 6600
6600 GOTO 6610
6610 GOTO 6620
6620 GOTO 6630
6630 GOTO 6640
6640 GOTO 6650
6650 GOTO 6660
6660 GOTO 6670
6670 GOTO 6680
6680 GOTO 6690
6690 GOTO 6700
6700 GOTO 6710
6710 GOTO 6720
6720 GOTO 6730
6730 GOTO 6740
6740 GOTO 6750
6750 GOTO 6760
6760 GOTO 6770
6770 GOTO 6780
6780 GOTO 6790
6790 GOTO 6800
6800 GOTO 6810
6810 GOTO 6820
6820 GOTO 6830
6830 GOTO 6840
6840 GOTO 6850
6850 GOTO 6860
6860 GOTO 6870
6870 GOTO 6880
6880 GOTO 6890
6890 GOTO 6900
6900 GOTO 6910
6910 GOTO 6920
6920 GOTO 6930
6930 GOTO 6940
6940 GOTO 6950
6950 GOTO 6960
6960 GOTO 6970
6970 GOTO 6980
6980 GOTO 6990
6990 GOTO 7000
7000 GOTO 7010
7010 GOTO 7020
7020 GOTO 7030
7030 GOTO 7040
7040 GOTO 7050
7050 GOTO 7060
7060 GOTO 7070
7070 GOTO 7080
7080 GOTO 7090
7090 GOTO 7100
7100 GOTO 7110
7110 GOTO 7120
7120 GOTO 7130
7130 GOTO 7140
7140 GOTO 7150
7150 GOTO 7160
7160 GOTO 7170
7170 GOTO 7180
7180 GOTO 7190
7190 GOTO 7200
7200 GOTO 7210
7210 GOTO 7220
7220 GOTO 7230
7230 GOTO 7240
7240 GOTO 7250
7250 GOTO 7260
7260 GOTO 7270
7270 GOTO 7280
7280 GOTO 7290
7290 GOTO 7300
7300 GOTO 7310
7310 GOTO 7320
7320 GOTO 7330
7330 GOTO 7340
7340 GOTO 7350
7350 GOTO 7360
7360 GOTO 7370
7370 GOTO 7380
7380 GOTO 7390
7390 GOTO 7400
7400 GOTO 7410
7410 GOTO 7420
7420 GOTO 7430
7430 GOTO 7440
7440 GOTO 7450
7450 GOTO 7460
7460 GOTO 7470
7470 GOTO 7480
7480 GOTO 7490
7490 GOTO 7500
7500 GOTO 7510
7510 GOTO 7520
7520 GOTO 7530
7530 GOTO 7540
7540 GOTO 7550
7550 GOTO 7560
7560 GOTO 7570
7570 GOTO 7580
7580 GOTO 7590
7590 GOTO 7600
7600 GOTO 7610
7610 GOTO 7620
7620 GOTO 7630
7630 GOTO 7640
7640 GOTO 7650
7650 GOTO 7660
7660 GOTO 7670
7670 GOTO 7680
7680 GOTO 7690
7690 GOTO 7700
7700 GOTO 7710
7710 GOTO 7720
7720 GOTO 7730
7730 GOTO 7740
7740 GOTO 7750
7750 GOTO 7760
7760 GOTO 7770
7770 GOTO 7780
7780 GOTO 7790
7790 GOTO 7800
7800 GOTO 7810
7810 GOTO 7820
7820 GOTO 7830
7830 GOTO 7840
7840 GOTO 7850
7850 GOTO 7860
7860 GOTO 7870
7870 GOTO 7880
7880 GOTO 7890
7890 GOTO 7900
7900 GOTO 7910
7910 GOTO 7920
7920 GOTO 7930
7930 GOTO 7940
7940 GOTO 7950
7950 GOTO 7960
7960 GOTO 7970
7970 GOTO 7980
7980 GOTO 7990
7990 GOTO 8000
8000 GOTO 8010
8010 GOTO 8020
8020 GOTO 8030
8030 GOTO 8040
8040 GOTO 8050
8050 GOTO 8060
8060 GOTO 8070
8070 GOTO 8080
8080 GOTO 8090
8090 GOTO 8100
8100 GOTO 8110
8110 GOTO 8120
8120 GOTO 8130
8130 GOTO 8140
8140 GOTO 8150
8150 GOTO 8160
8160 GOTO 8170
8170 GOTO 8180
8180 GOTO 8190
8190 GOTO 8200
8200 GOTO 8210
8210 GOTO 8220
8220 GOTO 8230
8230 GOTO 8240
8240 GOTO 8250
8250 GOTO 8260
8260 GOTO 8270
8270 GOTO 8280
8280 GOTO 8290
8290 GOTO 8300
8300 GOTO 8310
8310 GOTO 8320
8320 GOTO 8330
8330 GOTO 8340
8340 GOTO 8350
8350 GOTO 8360
8360 GOTO 8370
8370 GOTO 8380
8380 GOTO 8390
8390 GOTO 8400
8400 GOTO 8410
8410 GOTO 8420
8420 GOTO 8430
8430 GOTO 8440
8440 GOTO 8450
8450 GOTO 8460
8460 GOTO 8470
8470 GOTO 8480
8480 GOTO 8490
8490 GOTO 8500
8500 GOTO 8510
8510 GOTO 8520
8520 GOTO 8530
8530 GOTO 8540
8540 GOTO 8550
8550 GOTO 8560
8560 GOTO 8570
8570 GOTO 8580
8580 GOTO 8590
8590 GOTO 8600
8600 GOTO 8610
8610 GOTO 8620
8620 GOTO 8630
8630 GOTO 8640
8640 GOTO 8650
8650 GOTO 8660
8660 GOTO 8670
8670 GOTO 8680
8680 GOTO 8690
8690 GOTO 8700
8700 GOTO 8710
8710 GOTO 8720
8720 GOTO 8730
8730 GOTO 8740
8740 GOTO 8750
8750 GOTO 8760
8760 GOTO 8770
8770 GOTO 8780
8780 GOTO 8790
8790 GOTO 8800
8800 GOTO 8810
8810 GOTO 8820
8820 GOTO 8830
8830 GOTO 8840
8840 GOTO 8850
8850 GOTO 8860
8860 GOTO 8870
8870 GOTO 8880
8880 GOTO 8890
8890 GOTO 8900
8900 GOTO 8910
8910 GOTO 8920
8920 GOTO 8930
8930 GOTO 8940
8940 GOTO 8950
8950 GOTO 8960
8960 GOTO 8970
8970 GOTO 8980
8980 GOTO 8990
8990 GOTO 9000
9000 GOTO 9010
9010 GOTO 9020
9020 GOTO 9030
9030 GOTO 9040
9040 GOTO 9050
9050 GOTO 9060
9060 GOTO 9070
9070 GOTO 9080
9080 GOTO 9090
9090 GOTO 9100
9100 GOTO 9110
9110 GOTO 9120
9120 GOTO 9130
9130 GOTO 9140
9140 GOTO 9150
9150 GOTO 9160
9160 GOTO 9170
9170 GOTO 9180
9180 GOTO 9190
9190 GOTO 9200
9200 GOTO 9210
9210 GOTO 9220
9220 GOTO 9230
9230 GOTO 9240
9240 GOTO 9250
9250 GOTO 9260
9260 GOTO 9270
9270 GOTO 9280
9280 GOTO 9290
9290 GOTO 9300
9300 GOTO 9310
9310 GOTO 9320
9320 GOTO 9330
9330 GOTO 9340
9340 GOTO 9350
9350 GOTO 9360
9360 GOTO 9370
9370 GOTO 9380
9380 GOTO 9390
9390 GOTO 9400
9400 GOTO 9410
9410 GOTO 9420
9420 GOTO 9430
9430 GOTO 9440
9440 GOTO 9450
9450 GOTO 9460
9460 GOTO 9470
9470 GOTO 9480
9480 GOTO 9490
9490 GOTO 9500
9500 GOTO 9510
9510 GOTO 9520
9520 GOTO 9530
9530 GOTO 9540
9540 GOTO 9550
9550 GOTO 9560
9560 GOTO 9570
9570 GOTO 9580
9580 GOTO 9590
9590 GOTO 9600
9600 GOTO 9610
9610 GOTO 9620
9620 GOTO 9630
9630 GOTO 9640
9640 GOTO 9650
9650 GOTO 9660
9660 GOTO 9670
9670 GOTO 9680
9680 GOTO 9690
9690 GOTO 9700
9700 GOTO 9710
9710 GOTO 9720
9720 GOTO 9730
9730 GOTO 9740
9740 GOTO 9750
9750 GOTO 9760
9760 GOTO 9770
9770 GOTO 9780
9780 GOTO 9790
9790 GOTO 9800
9800 GOTO 9810
9810 GOTO 9820
9820 GOTO 9830
9830 GOTO 9840
9840 GOTO 9850
9850 GOTO 9860
9860 GOTO 9870
9870 GOTO 9880
9880 GOTO 9890
9890 GOTO 9900
9900 GOTO 9910
9910 GOTO 9920
9920 GOTO 9930
9930 GOTO 9940
9940 GOTO 9950
9950 GOTO 9960
9960 GOTO 9970
9970 GOTO 9980
```



# PROGRAMMING: AMSTRAD CPC

```

1000000 1,1000000:FOR w=0 TO 16 STEP
1
200 FOR q=qw,w,1:PRINT CH$(43):NEXT
1,q
300 FOR i
400 TAB(7)PRINT CH$(23);CH$(5);CH$(8)
500 TAB(10)CH$(3);CH$(9)PRINT CH$(23);
CH$(11);CH$(10)
600 :
700 :
800 CH$(8)=CH$(9)
900 PLUT 100,100:CH$(8)=CH$(10):CH$(8)=CH$(9)
1000:CH$(8)=CH$(9)
1100 PLUT 1,100:CH$(8)=CH$(9):CH$(8)=CH$(9)
1200:CH$(8)=CH$(9):CH$(8)=CH$(9)
1300:CH$(8)=CH$(9):CH$(8)=CH$(9)
1400:CH$(8)=CH$(9):CH$(8)=CH$(9)
1500:CH$(8)=CH$(9):CH$(8)=CH$(9)
1600:CH$(8)=CH$(9):CH$(8)=CH$(9)
1700:CH$(8)=CH$(9):CH$(8)=CH$(9)
1800:CH$(8)=CH$(9):CH$(8)=CH$(9)
1900:CH$(8)=CH$(9):CH$(8)=CH$(9)
2000:CH$(8)=CH$(9):CH$(8)=CH$(9)
2100:CH$(8)=CH$(9):CH$(8)=CH$(9)
2200:CH$(8)=CH$(9):CH$(8)=CH$(9)
2300:CH$(8)=CH$(9):CH$(8)=CH$(9)
2400:CH$(8)=CH$(9):CH$(8)=CH$(9)
2500:CH$(8)=CH$(9):CH$(8)=CH$(9)
2600:CH$(8)=CH$(9):CH$(8)=CH$(9)
2700:CH$(8)=CH$(9):CH$(8)=CH$(9)
2800:CH$(8)=CH$(9):CH$(8)=CH$(9)
2900:CH$(8)=CH$(9):CH$(8)=CH$(9)
3000:CH$(8)=CH$(9):CH$(8)=CH$(9)
3100:CH$(8)=CH$(9):CH$(8)=CH$(9)
3200:CH$(8)=CH$(9):CH$(8)=CH$(9)
3300:CH$(8)=CH$(9):CH$(8)=CH$(9)
3400:CH$(8)=CH$(9):CH$(8)=CH$(9)
3500:CH$(8)=CH$(9):CH$(8)=CH$(9)
3600:CH$(8)=CH$(9):CH$(8)=CH$(9)
3700:CH$(8)=CH$(9):CH$(8)=CH$(9)
3800:CH$(8)=CH$(9):CH$(8)=CH$(9)
3900:CH$(8)=CH$(9):CH$(8)=CH$(9)
4000:CH$(8)=CH$(9):CH$(8)=CH$(9)
4100:CH$(8)=CH$(9):CH$(8)=CH$(9)
4200:CH$(8)=CH$(9):CH$(8)=CH$(9)
4300:CH$(8)=CH$(9):CH$(8)=CH$(9)
4400:CH$(8)=CH$(9):CH$(8)=CH$(9)
4500:CH$(8)=CH$(9):CH$(8)=CH$(9)
4600:CH$(8)=CH$(9):CH$(8)=CH$(9)
4700:CH$(8)=CH$(9):CH$(8)=CH$(9)
4800:CH$(8)=CH$(9):CH$(8)=CH$(9)
4900:CH$(8)=CH$(9):CH$(8)=CH$(9)
5000:CH$(8)=CH$(9):CH$(8)=CH$(9)
5100:CH$(8)=CH$(9):CH$(8)=CH$(9)
5200:CH$(8)=CH$(9):CH$(8)=CH$(9)
5300:CH$(8)=CH$(9):CH$(8)=CH$(9)
5400:CH$(8)=CH$(9):CH$(8)=CH$(9)
5500:CH$(8)=CH$(9):CH$(8)=CH$(9)
5600:CH$(8)=CH$(9):CH$(8)=CH$(9)
5700:CH$(8)=CH$(9):CH$(8)=CH$(9)
5800:CH$(8)=CH$(9):CH$(8)=CH$(9)
5900:CH$(8)=CH$(9):CH$(8)=CH$(9)
6000:CH$(8)=CH$(9):CH$(8)=CH$(9)
6100:CH$(8)=CH$(9):CH$(8)=CH$(9)
6200:CH$(8)=CH$(9):CH$(8)=CH$(9)
6300:CH$(8)=CH$(9):CH$(8)=CH$(9)
6400:CH$(8)=CH$(9):CH$(8)=CH$(9)
6500:CH$(8)=CH$(9):CH$(8)=CH$(9)
6600:CH$(8)=CH$(9):CH$(8)=CH$(9)
6700:CH$(8)=CH$(9):CH$(8)=CH$(9)
6800:CH$(8)=CH$(9):CH$(8)=CH$(9)
6900:CH$(8)=CH$(9):CH$(8)=CH$(9)
7000:CH$(8)=CH$(9):CH$(8)=CH$(9)
7100:CH$(8)=CH$(9):CH$(8)=CH$(9)
7200:CH$(8)=CH$(9):CH$(8)=CH$(9)
7300:CH$(8)=CH$(9):CH$(8)=CH$(9)
7400:CH$(8)=CH$(9):CH$(8)=CH$(9)
7500:CH$(8)=CH$(9):CH$(8)=CH$(9)
7600:CH$(8)=CH$(9):CH$(8)=CH$(9)
7700:CH$(8)=CH$(9):CH$(8)=CH$(9)
7800:CH$(8)=CH$(9):CH$(8)=CH$(9)
7900:CH$(8)=CH$(9):CH$(8)=CH$(9)
8000:CH$(8)=CH$(9):CH$(8)=CH$(9)
8100:CH$(8)=CH$(9):CH$(8)=CH$(9)
8200:CH$(8)=CH$(9):CH$(8)=CH$(9)
8300:CH$(8)=CH$(9):CH$(8)=CH$(9)
8400:CH$(8)=CH$(9):CH$(8)=CH$(9)
8500:CH$(8)=CH$(9):CH$(8)=CH$(9)
8600:CH$(8)=CH$(9):CH$(8)=CH$(9)
8700:CH$(8)=CH$(9):CH$(8)=CH$(9)
8800:CH$(8)=CH$(9):CH$(8)=CH$(9)
8900:CH$(8)=CH$(9):CH$(8)=CH$(9)
9000:CH$(8)=CH$(9):CH$(8)=CH$(9)
9100:CH$(8)=CH$(9):CH$(8)=CH$(9)
9200:CH$(8)=CH$(9):CH$(8)=CH$(9)
9300:CH$(8)=CH$(9):CH$(8)=CH$(9)
9400:CH$(8)=CH$(9):CH$(8)=CH$(9)
9500:CH$(8)=CH$(9):CH$(8)=CH$(9)
9600:CH$(8)=CH$(9):CH$(8)=CH$(9)
9700:CH$(8)=CH$(9):CH$(8)=CH$(9)
9800:CH$(8)=CH$(9):CH$(8)=CH$(9)
9900:CH$(8)=CH$(9):CH$(8)=CH$(9)

```

## We want your programs!!

**Y**es, this is your chance to get rich and famous. Well, famous anyway, as Popular Computing Weekly is looking for contributors to its Programming pages.

What sort of thing are we looking for? You name it - anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you call trick art.

Programs for any computer will be considered, not just the old faithful

Spectrum, Amstrad, CL, Commodore, etc., so send those things in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 1000 words.

Alternatively, send in your short programs in the Bytes and Pieces page - what could be easier?

In return, we'll pay the princely sum of £25/page for the main programming

pages and £10 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the Popular Programming Hall of Fame in fine immortal. What more could any true programmer ask?

Just send your masterpieces in to Brian Evans, Technical Editor, Popular Computing Weekly, 12-13 Little Newport St, London WC2E 8PP and let us know when you post.







## Fail Safe

Keith Irving

**T**his interrupt driven Spectrum routine provides a secondary break facility for those machine code programmers

that find their code trapped in an endless loop. Turn it on with RANDOMIZE 65000

To break out of a program press Symbol Shift and break together to return to basic.

```
10 REM POKE "FAIL-SAFE" CODE INTO MEMORY
20 CLEAR 64999
30 FOR N=65000 TO 65000+67
40 READ X: POKE N,X: NEXT N
50 DATA 62, 233, 237, 71, 237, 74, 241, 0, 0, 0, 62, 63, 237,
71, 237, 66, 241, 0, 0, 0, 0, 0, 6, 254, 0, 0, 0, 0,
0, 229, 213, 197, 249, 255, 243, 62, 127, 219, 254,
238, 3, 48, 7, 241, 193, 249, 225, 251, 237, 77, 241,
193, 249, 225, 251, 1, 0, 128, 11, 128, 177, 32, 251,
17, 198, 28, 175, 153, 18
60 REM SAVE THE 70 BYTES OF CODE FROM ADDRESS 65000 ONWARDS
70 REM RELOAD WITH "CLEAR 64999: LOAD "name"CODE 65000
80 REM INTERRUPT ON = RANDOMIZE USR 65000
90 REM INTERRUPT OFF = RANDOMIZE USR 65018
100 REM TO CALL THE ROUTINE PRESS SYMBOL SHIFT+BREAK
```

## Sound Sampler

Keith Irving

**T**he Spectrum program lets you sample sound for up to four seconds. Sampled speech is reasonably intelligible but could be greatly improved by the use of an external filter.

Press R to record the sample and P to play it back again.

```
10 REM POKE "SAMPLER" CODE INTO MEMORY
20 CLEAR 64999
30 FOR N=65000 TO 65000+67
40 READ X: POKE N,X: NEXT N
50 DATA 33, 232, 128, 14, 253, 248, 6, 0, 219, 254, 7, 7, 248,
19, 14, 248, 0, 0, 0, 0, 114, 35, 124, 185, 194, 238,
253, 251, 281, 0, 33, 252, 128, 14, 253, 58, 73, 92,
15, 19, 15, 238, 7, 95, 243, 124, 15, 15, 15, 87, 6, 0,
122, 179, 211, 254, 283, 18, 14, 248, 35, 124, 185,
194, 21, 254, 251, 281
60 POKE 25500,0: CLG
70 PRINT FLASH 1:AT 11.6:"PRESS":FLASH 8:"R TO RECORD"
80 PRINT AT 13.12:"P TO PLAY BACK"
90 IF INKEY="R" THEN PRINT FLASH 1:AT 11.12:"R": RANDOMIZE USR
65000: GO TO 70
100 IF INKEY="P" THEN GO TO 90
110 PRINT FLASH 1:AT 13.12:"P": RANDOMIZE USR 65018: GO TO 70
```

## Selective Copy

Adrian Short

**T**his routine for the Spectrum and any ZX Printer compatible emulates the COPY command, except that it allows you to copy any part of the screen.

When reloading the routine use CLEAR 67135 first. To use the routine enter POKE 67137, top line; POKE 67138, number of lines and then RANDOMIZE USR 67139 to perform the copy.

```
10 REM XXXXXXXXXXXXXXXXXXXX
20 REM AT 8.5:POKE 1874,87
30 CLEAR 67135
40 FOR A=67136 TO 67182
50 COPY 0: POKE A,0
60 NEXT A
70 STOP "SLOCCOPY" CODE 67136,47
80 DATA 38,0,48,84,839,124,888
,183,14,888
90 DATA 237,235,225,58,48,888,
195,813,338,66
100 DATA 8,17,8,8,1,1,32,8,248,8
87,178
110 DATA 218,17,284,8,85,249,64
1,8,1,284,8
120 DATA 194,238,235,225,285,14
,261
```



## COMPUNET TO MOVE TO NEW MAINFRAME

Compunet is always changing and adding new areas of interest to subscribers. Now, as Graham Edkins reports, they are preparing for their biggest change yet.

Compunet could never be accused of being a static network, and from the very beginning it has been adding new ideas. The fact that the access software can be changed so easily by a simple automatic download of the latest code makes any innovations that much easier to implement.

Compunet is now working on its biggest change yet, moving to a new mainframe, which means that the latest ideas are having to wait their turn. However, the new mainframe is still on schedule (initially in the computer world) for its summer launch.

As the users can create their own directories and make their own new areas, the work on the new mainframe has not affected the growth of information, special interest groups (SIGs) or programs available. In fact, Compunet seems to have grown every time that you login, so it is easy to get used to one particular area or even a few areas and miss the changes going on in others.

Routes to others are given at the bottom of each directory to encourage you to 'jump' to a different, maybe unexplored part of the network, with the touch of a function key. Alpha gates, similar to those which Prestel first introduced, also make it easy to move around from one area to another and avoid the long slog through directory after directory.

Even with such ease of movement it's very tempting to settle down into a safe pattern so I decided to take a good look around and see what's happening. In my next report on Compunet I'll tell you what I found in the Demos area, where I'll concentrate on the ones that are not to be missed. This time however we'll look at some of the areas on the rest of systems, many of which are new to me, although many are old friends which deserve another look.

I would guess that most people start their on-line session by hitting GOTO in the dashboard and typing NEWS. This is where the editor of Compunet writes about the latest new pages to see. Many of these have been given quite a short life by the

person that uploaded them and so the news itself only survives for a couple of weeks at the most and there is normally an updated news two or three times every week.



It is very difficult for the editor to see every new upload so if you feel that your latest masterpiece deserves a mention then drop a line to her on the ID FEEDBACK.

If you like your news to be about micro, hardware, software and computer peripherals then the place to look is the large (and growing) directory from JALI, it goes for the unusual title of The Electric Frog Plate, but GOTO FROG will take you straight there.

Amateur Radio enthusiasts have their needs catered for in the ARGO area, this is a Closed User Group but a small one of payment alone you entry to this area started by G4PHN. Aviation news can be found in AIRCRAFT and other news alpha gives the MARS and COMMS are also available. You'll probably find an area catering just about every minority, or for that matter majority, interest that you could think of if you don't then you can always start one!

If you prefer to be entertained instead of educated then there are a couple of other new pages to try. BCAF will lead to the Vicar's Trainset from RB22 while J112 and

others are very prolific in Shockwave (GOTO SHOCK). Further entertainment with a science fiction edge to a lot of it is in COSMOS where you will find well developed like HULK, Haters, Astronavy and Dr Who (GOTO HHS, AS, TRD & HHS).

Over in the Labyrinth Dr. There is everything to do with role playing games, the multi-user game MUD of course and WILDFY which is a small section of MUD which can be used as a replacement message for just 50p per hour but you will also find things like the Play by Mail directory (GOTO PBM) and the armory where Zagger gives instructions for making a magic sword or an axe. As the word labyrinth is too long for a keyword they have given it the gate 'CAVES'.

There are many places to look on the system apart from NEWS to find the latest uploads, try GOTO5 which is a list of page adverts or the

Chat-on-line area (GOTO CHAT) where many Compunetters promote their uploads. NEWS gives you a good starting point for any voyage around the network and also lists many of the Alpha SIGs.

All of this travelling around what has now become a very large database, considering that it is currently dedicated to only one micro, has proved too much for you, then I can recommend settling down to a good and thought provoking read in the Arena area (GOTO ARENA) where other visitors have to be given their views on such controversial topics as religion, the channel tunnel, women in computing, AIDS education and South Africa. You may well find yourself duty bound to express your own opinion by uploading into its discussion.

I hope that there has been something mentioned on this page that will in the future be added to your own list of 'calling places'. If you can't wait until the next Compunet article to tell you about the demos, for which Compunet has become so well known, then I'll direct you to Demos Reviews on Page 222222 and FRY TV Demos World on Page 222224.



# 2-Bit drumkit for the ST

2-Bit Systems released a drum package for Atari 8-bit micros some time ago. Now it has revised that package to work with the ST. Mark Jenkins looks it over.

A few months ago we looked at 2-Bit Systems' drum package for the Atari 8-bit micros. Now the company has modified the package to work with the ST, and has taken the opportunity to launch several options for different musical applications.

2-Bit has also thrown in its bit with Microdeal, which will be distributing the ST Drumkit both here and in the States. No doubt this will give the company much wider exposure, which it bound to be a good thing.

The nicely-coloured Digidrum disk (it's bright purple, actually, you can't miss it) contains just one disk and a Handbook, and the optional Sample Disc 1 has a leaflet listing the sounds contained therein. There are 41 sounds included, which for the sake of completeness we list below.

1 Kick	15 Ethnic	29 Cuck 2
2 Cello	16 Ethnic	30 Sax 1
3 Choir	17 Elephant	31 Sax 2
4 Clav	18 Ethnic	32 Sax 3
5 Concert	19 Ethnic	33 Sax 4
6 Computer	20 Ethnic	34 Softbass
7 Cnk	21 Hymns	35 Sck
8 Cxck	22 Hymns	36 Tambour
9 Cxck	23 Indian	37 Tmpans
10 Cxck	24 Lomings	38 Tmpans
11 Cxck	25 Mchngn	39 Trnk
12 Cxck	26 Mchngn	40 Wldm
13 Cxck	27 Mchngn	41 Glass
14 Cxck	28 Cuck 1	

You can arrange these sounds into two complete kits - for instance, using all the E-prefixed sounds to create a 30-piece electronic kit, or using the G-prefix, bush, conga, clavi and so on to create a Latin kit.

A total of 16 sounds can be loaded and then use several sounds on the main disc to start you off. Incidentally, you can run the program on a 6305T or 1040ST with a colour or monochrome monitor or TV (in the case of the 6305T/M).

The instruction handbook is a little on the concise side (in fact it's just four sides long) and is a bit repetitive in some areas. For instance, it's not strictly true that Digidrum will "turn your Atari ST into a high quality sampling drum machine".

You can't do any sampling yourself - you need the optional Replay sampling system, which has been used to create the sounds supplied, sampling at around 2000/s.

The default kit on the main disc consists

of bass, snare, open and closed hi-hat, congas, and low and high tom, low and high bongo and cym. 60 patterns can be stored and these can have between 4 and 32 beats, patterns can be entered in step time or real time and linked together to produce a song of up to 70 patterns.

To increase the possible length of a song, you can also repeat a single pattern within the song or loop a whole sequence, and of course everything can be saved to disc.



If you do have the ST Replay cartridge you can connect its phone out socket to your hi-fi - otherwise you're limited to listening to samples via your monitor. If you auto-run "Drum PPG" you'll hear a demo song and you can use the alternate key to select monitor or hi-fi (via the Replay cartridge) sound output.

The package doesn't use much of the 640k advertised and in fact works without a mouse. The cursor arrow keys are used to move along the top of the screen options, which are speed, tempo, edit song, play song, add pattern, load, save and info, the last of these simply repeating some of the specification from the handbook.

Some of the terminology in the other options is very poorly chosen. What 2-bit chooses to call "speed" is actually sampling rate, which can be set to 2000/s for the highest quality or 1000/s for the longest time. All samples are described as being "1000/s in length" - perhaps this means 1000?

When we do get on to what you can and might call speed - or "tempo," if you like - we find that 2-bit has made it variable from one to 48. But is 48 faster or slower than one? Well, logically enough (7% it's slower) - the logic being that the tempo setting indicates the number of 100/s counts taken between beats.

Edit song is a slightly more sensitive option, setting up a long list of 70 patterns together with the number of times they should be repeated and a suitable tempo. Figures are entered using the numeric keys and you have to go along a whole line, once you've reached it using the cursor keys - in other words, you have to enter the pattern number again even if you only want to change the number of times it repeats.

You can wipe a complete song using the edit song menu and have the same option on the pattern menu. Patterns are entered on a grid offering any 16 sounds matrixed against up to 16 beats. The Digidrum package can sound two voices simultaneously and these must have samples assigned to them as voice one and voice two; if you attempt to play the same channel twice then the first entry will be deleted.

Granted, the demo do show that you can create up with quite complex patterns using just two voices. If you prefer to enter beats in real time, just go to the real time option and you can enter beats by tapping F1 (for whatever sound is currently assigned to voice one) and F2 (for voice two).

You can load and save a song, a set of voices, a pattern or a song, as the method of assigning sounds to songs is quite flexible. There are a few disc error messages, mostly dedicated to announcing the fact that your disc is full, 16 samples taking 200K of disc space.

During playback the package sounds pretty good, and you can create long and complex songs quite quickly with reasonably bright, crisp sounds. However, I'd be very surprised if there were any musicians on the 2-bit team - the tempo assignment, method of pattern entry into songs, lack of pitch control for the tuned sounds, neglect of the mouse and inconsistency of the hand book are all reprehensibly unprofessional.

Digidrum costs £19.95 and Sample Disc 1 costs £14.99; more information from Microdeal at the address below.

Microdeal Ltd, PO Box 68, St Asaph, Conwy LL23 4JL, 0776 65020.

If you have any queries or tips for this column, please write to Mark Jenkins at Popular Computing Weekly, 12-13 Little Newport Street, London WC2N 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.



# MICRO-FILE

CALL SUBANNAH KING on 01-437 4343 FOR SEMI DISPLAY ADVERTISING

## SOFTWARE

# ATARI 520 STFM

NOW IN STOCK  
FOR ONLY

# £359.95

### SPECIAL OFFER

Atari 520 STFM complete with mouse,  
1 meg disc drive 488

**£429.95**

Complete with manuals and demos

### SPECIAL OFFER

Atari 520 STFM complete with mouse, 512K (500K) disc drive,  
2811/5 mouse monitor, 1st Word processor

**£449.95**

### WING STOCKS LIST

### AMIGA A500

- ★ 68000 Chip with 512K Ram    ★ Built in 68000 3 1/2" disc drive
- ★ Mouse controller            ★ 4096 colour and stereo sound
- ★ Built in speech                ★ Please phone for details

**£538.95**

### PRINTERS

Panasonic 80 dot, 120 gpi 16.5 mode	£118
Canon A88 90 dot, 240 gpi, 180 gpi 16.5 mode	£179
Panasonic 1020 80 dot, 180 gpi 16.5 mode	£175

16 3/4" disc	£14.00
--------------	--------

### ST SOFTWARE AT GIVEAWAY PRICES

Pacem	19.95	Robotical Face	19.95
Scaphoon	19.95	Samurai Kid	19.95
Tapphoun	19.95	T.T. Race	19.95
Whizz Games	19.95	Amiga	24.95
World Games	19.95	King's Quest II	24.95
Phantasm II	19.95	Ray Fox	19.95
Ice Karpis	19.95	Travis Challenge	19.95
Silks Samurai	19.95	Sports 40	19.95
Trap-Door	19.95	Ragnar	19.95
Temple Prince	19.95	Moonside	24.95
Q-Ball	19.95	Ten Up Golf	19.95
Leaderboard	19.95	2 on 2 Basket	19.95
Music Studio	27.95	Little Comp People	29.95
Eden Blues	19.95	Goodrunner	19.95
Harriet	19.95	Survivor	19.95
Super Heavy	19.95	Pulse	19.95
Tactical	24.95	Arkensis	19.95
Pro Sprite Designer	29.95	Matrix Cross	19.95
Space Pilot	19.95	Balance of Power	29.95
Mancunary	19.95	Championship Football	19.95
Shredding	19.95	Spiral	19.95
ST Karpis	14.95	Turbo ST Player	19.95
Karate Master	9.95	Profound Designer	49.95

## ATARI 520 STFM

Includes: mouse controller, manuals, language disc plus demos.

## SOUND N VISION

11 Sals Rd, Leigh, Lancs WN7 1AW. Tel: 09421 673669

Cheques and P.O. Orders payable to: Sound N Vision

A.S.P./VAT INCL/ODD

## CLASSIFIED ADVERTISING RATES:

Line by line: 20p per word,  
minimum 20 words.

Semi Display: £7 per single  
column (ordinating  
minimum length 2pm.  
Please supply 4/10s ap PMT  
or supply rough setting  
instructions.)

Conditions: All copy for  
classified section must be  
pre-paid. Copy date 7 days  
before publication.

For phone bookings  
Ring Subanna King on 01-  
437 4343.



## Here's my classified ad.

(Please write your copy in capital letters on the lines below)


Please continue on a separate sheet of paper.

I make this \_\_\_\_\_ words, at \_\_\_\_\_ per word, plus VAT \_\_\_\_\_, so I want you £ \_\_\_\_\_

Name \_\_\_\_\_ [Please add 18% to these rates for VAT]

Address \_\_\_\_\_  
  I enclose a cheque for this amount  
 or please charge my Access/  
 Visa credit card number \_\_\_\_\_

Telephone \_\_\_\_\_

Please cut out and send this form to: Classified Department,  
Popular Computing Weekly, 10-12 Little Newport Street, London WC2N 7PP.















## FOR SALE

### BLANK CASSETTES

#### POPULAR LIBRARY CHOICE

100	100	100	100
100	100	100	100
100	100	100	100
100	100	100	100

Full features 60, 90, 120 mins.

#### CHIPS

100% QUALITY

100% QUALITY

100% QUALITY

100% QUALITY

100% QUALITY

#### MINI-TECH COMPUTERS AND ACCESSORIES

AT 512K COMPUTER	£195.00
AT 1024K COMPUTER	£295.00
AT 2048K COMPUTER	£395.00
AT 4096K COMPUTER	£495.00
AT 8192K COMPUTER	£595.00
AT 16384K COMPUTER	£695.00
AT 32768K COMPUTER	£795.00
AT 65536K COMPUTER	£895.00
AT 131072K COMPUTER	£995.00
AT 262144K COMPUTER	£1095.00
AT 524288K COMPUTER	£1195.00
AT 1048576K COMPUTER	£1295.00
AT 2097152K COMPUTER	£1395.00
AT 4194304K COMPUTER	£1495.00
AT 8388608K COMPUTER	£1595.00
AT 16777216K COMPUTER	£1695.00
AT 33554432K COMPUTER	£1795.00
AT 67108864K COMPUTER	£1895.00
AT 134217728K COMPUTER	£1995.00
AT 268435456K COMPUTER	£2095.00
AT 536870912K COMPUTER	£2195.00
AT 1073741824K COMPUTER	£2295.00
AT 2147483648K COMPUTER	£2395.00
AT 4294967296K COMPUTER	£2495.00
AT 8589934592K COMPUTER	£2595.00
AT 17179869184K COMPUTER	£2695.00
AT 34359738368K COMPUTER	£2795.00
AT 68719476736K COMPUTER	£2895.00
AT 137438953472K COMPUTER	£2995.00
AT 274877906944K COMPUTER	£3095.00
AT 549755813888K COMPUTER	£3195.00
AT 1099511627776K COMPUTER	£3295.00
AT 2199023255552K COMPUTER	£3395.00
AT 4398046511104K COMPUTER	£3495.00
AT 8796093022208K COMPUTER	£3595.00
AT 17592186044416K COMPUTER	£3695.00
AT 35184372088832K COMPUTER	£3795.00
AT 70368744177664K COMPUTER	£3895.00
AT 140737488355328K COMPUTER	£3995.00
AT 281474976710656K COMPUTER	£4095.00
AT 562949953421312K COMPUTER	£4195.00
AT 1125899906842624K COMPUTER	£4295.00
AT 2251799813685248K COMPUTER	£4395.00
AT 4503599627370496K COMPUTER	£4495.00
AT 9007199254740992K COMPUTER	£4595.00
AT 18014398509481984K COMPUTER	£4695.00
AT 36028797018963968K COMPUTER	£4795.00
AT 72057594037927936K COMPUTER	£4895.00
AT 144115188075855872K COMPUTER	£4995.00
AT 288230376151711744K COMPUTER	£5095.00
AT 576460752303423488K COMPUTER	£5195.00
AT 1152921504606846976K COMPUTER	£5295.00
AT 2305843009213693952K COMPUTER	£5395.00
AT 4611686018427387904K COMPUTER	£5495.00
AT 9223372036854775808K COMPUTER	£5595.00
AT 18446744073709551616K COMPUTER	£5695.00
AT 36893488147419103232K COMPUTER	£5795.00
AT 73786976294838206464K COMPUTER	£5895.00
AT 147573952589676412928K COMPUTER	£5995.00
AT 295147905179352825856K COMPUTER	£6095.00
AT 590295810358705651712K COMPUTER	£6195.00
AT 1180591620717411303424K COMPUTER	£6295.00
AT 2361183241434822606848K COMPUTER	£6395.00
AT 4722366482869645213696K COMPUTER	£6495.00
AT 9444732965739290427392K COMPUTER	£6595.00
AT 18889465931478580854784K COMPUTER	£6695.00
AT 37778931862957161709568K COMPUTER	£6795.00
AT 75557863725914323419136K COMPUTER	£6895.00
AT 151115727451828646838272K COMPUTER	£6995.00
AT 302231454903657293676544K COMPUTER	£7095.00
AT 604462909807314587353088K COMPUTER	£7195.00
AT 1208925819614629174706176K COMPUTER	£7295.00
AT 2417851639229258349412352K COMPUTER	£7395.00
AT 4835703278458516698824704K COMPUTER	£7495.00
AT 9671406556917033397649408K COMPUTER	£7595.00
AT 19342813113834066795298816K COMPUTER	£7695.00
AT 38685626227668133590597632K COMPUTER	£7795.00
AT 77371252455336267181195264K COMPUTER	£7895.00
AT 154742504910672534362390528K COMPUTER	£7995.00
AT 309485009821345068724781056K COMPUTER	£8095.00
AT 618970019642690137449562112K COMPUTER	£8195.00
AT 1237940039285380274899124224K COMPUTER	£8295.00
AT 2475880078570760549798248448K COMPUTER	£8395.00
AT 4951760157141521099596496896K COMPUTER	£8495.00
AT 9903520314283042199192993792K COMPUTER	£8595.00
AT 19807040628566084398385987584K COMPUTER	£8695.00
AT 39614081257132168796771975168K COMPUTER	£8795.00
AT 79228162514264337593543950336K COMPUTER	£8895.00
AT 158456325028528675187087900672K COMPUTER	£8995.00
AT 316912650057057350374175801344K COMPUTER	£9095.00
AT 633825300114114700748351602688K COMPUTER	£9195.00
AT 1267650600228229401496703205376K COMPUTER	£9295.00
AT 2535301200456458802993406410752K COMPUTER	£9395.00
AT 5070602400912917605986812821504K COMPUTER	£9495.00
AT 10141204801825835211973625643008K COMPUTER	£9595.00
AT 20282409603651670423947251286016K COMPUTER	£9695.00
AT 40564819207303340847894502572032K COMPUTER	£9795.00
AT 81129638414606681695789005144064K COMPUTER	£9895.00
AT 162259276829213363891780010288128K COMPUTER	£9995.00
AT 324518553658426727783560020576256K COMPUTER	£10095.00
AT 649037107316853455567120041152512K COMPUTER	£10195.00
AT 1298074214633706911134240822300224K COMPUTER	£10295.00
AT 2596148429267413822268481644600448K COMPUTER	£10395.00
AT 5192296858534827644536963289200896K COMPUTER	£10495.00
AT 1038459371706965528907392657841792K COMPUTER	£10595.00
AT 2076918743413931057814785315683584K COMPUTER	£10695.00
AT 4153837486827862115629570631367168K COMPUTER	£10795.00
AT 8307674973655724231259140262734336K COMPUTER	£10895.00
AT 16615349947311448462518280525468672K COMPUTER	£10995.00
AT 33230699894622896925036561050937344K COMPUTER	£11095.00
AT 66461399789245793850073122101874688K COMPUTER	£11195.00
AT 132922799578491587700146244203749376K COMPUTER	£11295.00
AT 265845599156983175400292488407498752K COMPUTER	£11395.00
AT 531691198313966350800584976814997504K COMPUTER	£11495.00
AT 106338239662793270160116995362995008K COMPUTER	£11595.00
AT 212676479325586540320233990725990016K COMPUTER	£11695.00
AT 425352958651173080640467981451980032K COMPUTER	£11795.00
AT 850705917302346161280935962903960064K COMPUTER	£11895.00
AT 1701411834604692322561871925807800128K COMPUTER	£11995.00
AT 3402823669209384645123743851615600256K COMPUTER	£12095.00
AT 6805647338418769290247487703231200512K COMPUTER	£12195.00
AT 13611294676837538580494975406462401024K COMPUTER	£12295.00
AT 27222589353675077160989950812924802048K COMPUTER	£12395.00
AT 54445178707350154321979901625849604096K COMPUTER	£12495.00
AT 108890357354700308643959803251698081192K COMPUTER	£12595.00
AT 217780714709400617287919606503396162384K COMPUTER	£12695.00
AT 435561429418801234575839213006792324768K COMPUTER	£12795.00
AT 871122858837602469151678426013584649536K COMPUTER	£12895.00
AT 174224571767520493830335685202769299072K COMPUTER	£12995.00
AT 348449143535040987660671370405538598144K COMPUTER	£13095.00
AT 696898287070081975321342740811077196288K COMPUTER	£13195.00
AT 1393796574140163950642685481622154392576K COMPUTER	£13295.00
AT 2787593148280327901285371363244308785152K COMPUTER	£13395.00
AT 557518629656065580257074272648861770304K COMPUTER	£13495.00
AT 1115037259312131160514148545317723540608K COMPUTER	£13595.00
AT 2230074518624262321028297090635447081216K COMPUTER	£13695.00
AT 4460149037248524642056594181270894162432K COMPUTER	£13795.00
AT 8920298074497049284113188362541788324864K COMPUTER	£13895.00
AT 1784059614899409856822637722508377669728K COMPUTER	£13995.00
AT 3568119229798819713645275445016755339456K COMPUTER	£14095.00
AT 7136238459597639427290550890033510678912K COMPUTER	£14195.00
AT 14272476919195278854581101780070213357824K COMPUTER	£14295.00
AT 28544953838390557709162203560140426715648K COMPUTER	£14395.00
AT 57089907676781115418324407120280853431296K COMPUTER	£14495.00
AT 11417981535356223083664881424056170662592K COMPUTER	£14595.00
AT 22835963070712446167329762848112341325184K COMPUTER	£14695.00
AT 45671926141424892334659525696224682650368K COMPUTER	£14795.00
AT 91343852282849784669319051392449365300736K COMPUTER	£14895.00
AT 182687704565699569338638102784898730601472K COMPUTER	£14995.00
AT 365375409131399138677276205569797461202944K COMPUTER	£15095.00
AT 730750818262798277354552411139594922405888K COMPUTER	£15195.00
AT 1461501636525596554709104822271898848011776K COMPUTER	£15295.00
AT 2923003273051193109418209644543797696023552K COMPUTER	£15395.00
AT 5846006546102386218836419289087595392047104K COMPUTER	£15495.00
AT 11692013092204772437672838578175190784094208K COMPUTER	£15595.00
AT 233840261844095448753456771563503815681888K COMPUTER	£15695.00
AT 4676805236881908975069135431270076313637776K COMPUTER	£15795.00
AT 93536104737638179501382708625401526275552K COMPUTER	£15895.00
AT 187072209475276359026765417250803052551104K COMPUTER	£15995.00
AT 374144418950552718053530834501606105102208K COMPUTER	£16095.00
AT 74828883790110543610706166900321222024416K COMPUTER	£16195.00
AT 14965776758022108722141233380064444048832K COMPUTER	£16295.00
AT 29931553516044217444282466760128888897664K COMPUTER	£16395.00
AT 59863107032088434888564933520257777795328K COMPUTER	£16495.00
AT 119726214064176869777129867040515554670656K COMPUTER	£16595.00
AT 239452428128353739554259734081031109141312K COMPUTER	£16695.00
AT 478904856256707479108519468162062218222624K COMPUTER	£16795.00
AT 957809712513414958217039136324124436445248K COMPUTER	£16895.00
AT 1915619425026829916354078272648488872890496K COMPUTER	£16995.00
AT 3831238850053659832708156545296977745780992K COMPUTER	£17095.00
AT 7662477700107319665416313090593955491561984K COMPUTER	£17195.00
AT 15324954400214639330832626181187910923123968K COMPUTER	£17295.00
AT 30649908800429278661665252362375821846247936K COMPUTER	£17395.00
AT 6129981760085855732333151072475164369249584K COMPUTER	£17495.00
AT 12259963520171711464666322444950328738499168K COMPUTER	£17595.00
AT 2451992704034342292933264488990065747699336K COMPUTER	£17695.00
AT 490398540806868458586659418127089416243776K COMPUTER	£17795.00
AT 9807970816137369171733057955960262990797344K COMPUTER	£17895.00
AT 1961594163227473834346611511992525981594688K COMPUTER	£17995.00
AT 3923188326454947668693223023985051963189376K COMPUTER	£18095.00
AT 7846376652909895337386446047970103926378752K COMPUTER	£18195.00
AT 15692753305819790674772892095940207852757504K COMPUTER	£18295.00
AT 31385506611639581349545784191880415705515008K COMPUTER	£18395.00
AT 62771013223279162699091568383760831411030016K COMPUTER	£18495.00
AT 12554202644655832539818313676752166282060032K COMPUTER	£18595.00
AT 25108405289311665079636627353504332564120064K COMPUTER	£18695.00
AT 50216810578623330159273254707008665128240128K COMPUTER	£18795.00
AT 10043362115724666031854650941401732646048256K COMPUTER	£18895.00
AT 20086724231449332063709301882803465292096512K COMPUTER	£18995.00
AT 40173448462898664127418603765606930584193024K COMPUTER	£19095.00
AT 8034689692579732825483720753121386116838656K COMPUTER	£19195.00
AT 160693793851546644105906601023254733288557	

Additional prices for 386/486 systems. All prices include 1 year warranty. All prices include



---



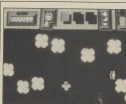
# NEW RELEASES

## Amstrad CPC

**Program** Five Star Games Type: Completion Price £18.95 Supplier: New July, 284, Bell Street, Bognor, Sussex BN1 1AD.

Simply, *Cauldron II* and *Alpin Highway* star with *Scorpius Blue* and *Football* as stars.

Simply, you might remember a *Scorpius* game answer to US *Goat* *Scorpius*, programmed by Paul Jam.



It's interesting how taking a sideways look at a particular game format and just changing one single aspect it can make such a difference to the gameplay.

Jordan Jeorgas has taken the simple arcade adventure/maze game - and played around with the gravity and friction aspects of the movement with *Kinoko*. As your hydro-craft moves from screen to screen (there are 43 'zones' in total), instead of the constant downward pull of gravity that dominates in most games, gravity and friction vary in each room.

In one room, for instance, there are two centres of gravity - one placed on the left of the screen, one on the right - which makes manoeuvring kind of difficult. In others, where atmospheric friction means that moving is like making your way through treacle.

It is your mission to sort out this abnormal state of affairs by collecting the three letters that spell out the 'word of power' (the mind boggles!) and then delivering them into the hands of the great knowledge - wherever it may be - who will put things to rights.

As in most games of this type, things may be picked up and used to aid you - like a chemical spray that will blast away all the nasties, a deflector shield that will fend them off and best of all, the R2 control (buttons) that will nullify the weird effects of the strange gravity.

You've got three lives - and as soon as your power gauge gets down to zero, that's one life gone. Some static objects will kill at the slightest contact though - so a deft touch with the joystick is essential.

Released on the full price Firebird label, written by tone West German programmer Jordan Jeorgas (said only by a 48K Spectrum, would you believe), but on Spectrum, Amstrad CPC and Commodore 64.

*Kinoko* is not a classic - but if you like this kind of arcade puzzle solving, it offers enough that is new to make it worth buying.

John Cook

Placed in a maze of dungeons filled with monsters, monster games, stars, food, doors, keys, the game has distinctive movie graphics - rather gothic in nature, if anything. One or simultaneous two player, it was considered a good quality title.

*Alpin Highway* is a variation of the original *Highway Encounter* from *Vox*. It played on roughly the same themes and stuck to the same style of graphics, but was a worthy follow-up, requiring sharp arcade skills and a keen brain to succeed.

*Cauldron II* is another follow up, but was very different from *Placid* as much in style you play the part of a bounting pumpkin that to keep the very witch you controlled in *Cauldron I*. The witch's palace (where the action takes place) is big old of houses, watch her at all cost.

*Football* is a game released when Mike-Jam was going through its media crisis, so don't sell too well - a shame because it's the first ever arcade adventure to feature in the sharing role, a *Scorpius* *II* sport, it looks like a *Scorpius*.

Lastly, *Scorpius Blue* from French company *Line Information*. This is a weird arcade adventure that has you breaking out from prison and sipping round the streets. It's quirky, visually attractive and very French.

Altogether, the four pack represents excellent value - obviously considering that some of the games are over a year or so old.

**Program** *Scorpius Blue* Type: Action Price £7.95 (Japan), £9.95 (USA) Supplier: US & Style Software, Mordyhouse, Cheshire, Co. Garside, Ireland.

*Scorpius Blue* is a very good example of the game for the CPC with a Light Cycle game on the top side.

**Program** *Kinoko* Type: Action Price £9.95 Supplier: Jordan Jeorgas, Alpha House, 10 Carver Street, Sheffield S1 4LS.



Another *Breakout*/*Island* variant, it's good and another that will get you the Commodore 64 if you can manage to solve the 100 levels.

**Program** *More Synth* Type: Action Price £18.95 (Japan), £14.95 (USA) Supplier: Ocean Software, 6 Central Street, Manchester M2 5JL.

Units 2/3 Halford Way, Halford, Birmingham B6 7AA.



Very disappointing conversion to the ST. The controls are mixed and dull, and control is via joystick only... although a few who play would have used mouse control, with separate mouse buttons for *Scorpius* and *Five*.

**Program** *Scorpius Blue* Type: Action Price £18.95 Supplier: Tynesoft, Jackson Industrial Estate, Maydon Lane, York, Type & Price M21 4TE.

*Scorpius Blue* and *Scorpius* on the ST, but it's a lovely implementation with some great features of *Scorpius* as you move your history, character from screen to screen. Completely charming - and it's not costing an arm and a leg.

## Atari XL/XE

**Program** *Witch's Crest* Type: Action Adventure Price £99.95 Supplier: US Gold, Units 2/3 Halford Way, Halford, Birmingham B6 7AA.

Atari XL/XE also based role-playing adventure from US, which includes a tactical combat section so the party can really get to grips with the monsters.

## BBC B

**Program** *Computer Mind* Type: Strategy Price £9.95 (also only - not action) Supplier: Mosaic, Unit 4/5 The Grange, London SW16 6PL.

Fast way to learn mind style game with you against the computer.

## Commodore 64

**Program** *Samurai Trilogy* Type: Action Price £15.95 Supplier: Ocean Software, Alpha House, 10 Carver Street, Sheffield.

continued on page 81

## Atari ST

**Program** *Scorpius Blue* Type: Action Price £18.95 Supplier: US Gold.





# 10-HUT!

**A**ctionson has timed the release of Gamestar's GFI Championship Football perfectly. Perfectly timing that is. With the Superdome's fading memory and the new American Football season many months away, interest is not running high at the moment. Hopefully this will not count against Gamestar's product as it features a style of graphics not seen before in a game of this type.

I speak of a Pope dimension view, both down on the ground. Here you get to play the wide receiver and like running back, like man in the special team going for goal with time running out.

Before you get into the action, you must go through the preliminaries of selecting the number of players, which teams to use (from 25, all named differently), and how long each quarter should last (four or seven minutes).

That dismissed with, it's down to pitch and the kickoff. After struggling to return the ball you are presented with a fairly long list of options for your first offensive play. The choice of running plays includes trap, draw, blind, pass, sweep and pitch, left or right. Trap and draw can usually be relied upon for small gains while the sweep and pitch options are riskier but can reap greater rewards.

After selecting your choice the opposition makes theirs and you get to play it out. The quarterback guarantees the call intelligently, real sampled grunting and yelling, and passes the ball to you. This is the moment of truth because you have to know exactly where to run to beat through the mess at the line of scrimmage. If you are lost a



*"Having broken free, you can stomp down the field - sticking out an arm, if you time it right, to fend off the desperate tackles. Should you manage to plough your way through the defense, then the end zone looms up and the crowd starts cheering!"*

couple of arrows at the bottom of the screen guide you in the right direction but by then it'll be too late to make a big gain.

Having broken free you can stomp down the field kicking out an arm, if you time it right, to fend off the desperate tackles. Should you manage to plough your way through the defense

then the end zone looms up and the crowd starts cheering.

The alternative to the effort of a running play is of course to throw the ball. There are a total of 22 options (11 left, 11 right) to choose from, from short slings passes to bombs far downfield.

The mode of operation here is to wait for the quarterback to

finish grunting and then exclude a precise number of steps in set directions. A long out left, for example, requires five steps forward, five to the left and one back. It has to be done exactly right and at the right time otherwise what the quarterback throws the ball you won't be there to meet it. Oh, that it were that simple. You also have the defense to contend with.

While the graphics are decidedly chunky they are presented in a clear 3D format, and the animation is quite reasonable. The sound, though, is pretty good, with the sampled sounds of the quarterback and commentator adding to the atmosphere.

With a choice of teams to play against, or a friend, Championship Football could keep you playing until the season really does start in September.

## Hints box

- Until you know the pass plays off by heart, try running the ball most of the time.
- The shorter passes are easier to use, so don't try a big or post until you really need it.
- Try to outthink your opponent by working out what your obvious move is and what their reaction would be. Then try something different that takes advantage of their response.
- Concentrate on timing your runs in pass plays so that you start moving after the quarterback calls the play but before the direction arrow appears.
- Each team in Championship Football has weak points. Try using plays designed to exploit these weaknesses most of the time.

**Duncan Emery**



**HSV COMPUTER  
SERVICES  
LIMITED**

**All our prices include carriage & VAT**  
— No extras to pay!

**Keywords:** child sexual abuse; disclosure; social support; self-esteem

[illegible]

UNIVERSITY OF CALIFORNIA LIBRARY

Date	Description	Amount					
		Debit	Credit	Balance	Debit	Credit	Balance
1/1/20	Opening Balance			100.00			100.00
1/5/20	Payment received		50.00	150.00			150.00
1/10/20	Payment made	20.00		130.00			130.00
1/15/20	Payment received		30.00	160.00			160.00
1/20/20	Payment made	10.00		150.00			150.00
1/25/20	Payment received		20.00	170.00			170.00
1/30/20	Payment made	15.00		155.00			155.00
2/1/20	Payment received		10.00	165.00			165.00
2/5/20	Payment made	5.00		160.00			160.00
2/10/20	Payment received		15.00	175.00			175.00
2/15/20	Payment made	12.00		163.00			163.00
2/20/20	Payment received		8.00	171.00			171.00
2/25/20	Payment made	7.00		164.00			164.00
2/28/20	Payment received		11.00	175.00			175.00
3/1/20	Payment made	6.00		169.00			169.00
3/5/20	Payment received		9.00	178.00			178.00
3/10/20	Payment made	4.00		174.00			174.00
3/15/20	Payment received		7.00	181.00			181.00
3/20/20	Payment made	3.00		178.00			178.00
3/25/20	Payment received		6.00	184.00			184.00
3/30/20	Payment made	2.00		182.00			182.00
3/31/20	Payment received		5.00	187.00			187.00
4/1/20	Payment made	1.00		186.00			186.00
4/5/20	Payment received		4.00	190.00			190.00
4/10/20	Payment made	1.00		189.00			189.00
4/15/20	Payment received		3.00	192.00			192.00
4/20/20	Payment made	0.50		191.50			191.50
4/25/20	Payment received		2.50	194.00			194.00
4/30/20	Payment made	0.50		193.50			193.50
4/31/20	Payment received		1.50	195.00			195.00
5/1/20	Payment made	0.50		194.50			194.50
5/5/20	Payment received		1.00	195.50			195.50
5/10/20	Payment made	0.50		195.00			195.00
5/15/20	Payment received		0.50	195.50			195.50
5/20/20	Payment made	0.50		195.00			195.00
5/25/20	Payment received		0.50	195.50			195.50
5/30/20	Payment made	0.50		195.00			195.00
5/31/20	Payment received		0.50	195.50			195.50
6/1/20	Payment made	0.50		195.00			195.00
6/5/20	Payment received		0.50	195.50			195.50
6/10/20	Payment made	0.50		195.00			195.00
6/15/20	Payment received		0.50	195.50			195.50
6/20/20	Payment made	0.50		195.00			195.00
6/25/20	Payment received		0.50	195.50			195.50
6/30/20	Payment made	0.50		195.00			195.00
6/31/20	Payment received		0.50	195.50			195.50
7/1/20	Payment made	0.50		195.00			195.00
7/5/20	Payment received		0.50	195.50			195.50
7/10/20	Payment made	0.50		195.00			195.00
7/15/20	Payment received		0.50	195.50			195.50
7/20/20	Payment made	0.50		195.00			195.00
7/25/20	Payment received		0.50	195.50			195.50
7/30/20	Payment made	0.50		195.00			195.00
7/31/20	Payment received		0.50	195.50			195.50
8/1/20	Payment made	0.50		195.00			195.00
8/5/20	Payment received		0.50	195.50			195.50
8/10/20	Payment made	0.50		195.00			195.00
8/15/20	Payment received		0.50	195.50			195.50
8/20/20	Payment made	0.50		195.00			195.00
8/25/20	Payment received		0.50	195.50			195.50
8/30/20	Payment made	0.50		195.00			195.00
8/31/20	Payment received		0.50	195.50			195.50
9/1/20	Payment made	0.50		195.00			195.00
9/5/20	Payment received		0.50	195.50			195.50
9/10/20	Payment made	0.50		195.00			195.00
9/15/20	Payment received		0.50	195.50			195.50
9/20/20	Payment made	0.50		195.00			195.00
9/25/20	Payment received		0.50	195.50			195.50
9/30/20	Payment made	0.50		195.00			195.00
9/31/20	Payment received		0.50	195.50			195.50
10/1/20	Payment made	0.50		195.00			195.00
10/5/20	Payment received		0.50	195.50			195.50
10/10/20	Payment made	0.50		195.00			195.00
10/15/20	Payment received		0.50	195.50			195.50
10/20/20	Payment made	0.50		195.00			195.00
10/25/20	Payment received		0.50	195.50			195.50
10/30/20	Payment made	0.50		195.00			195.00
10/31/20	Payment received		0.50	195.50			195.50
11/1/20	Payment made	0.50		195.00			195.00
11/5/20	Payment received		0.50	195.50			195.50
11/10/20	Payment made	0.50		195.00			195.00
11/15/20	Payment received		0.50	195.50			195.50
11/20/20	Payment made	0.50		195.00			195.00
11/25/20	Payment received		0.50	195.50			195.50
11/30/20	Payment made	0.50		195.00			195.00
11/31/20	Payment received		0.50	195.50			195.50
12/1/20	Payment made	0.50		195.00			195.00
12/5/20	Payment received		0.50	195.50			195.50
12/10/20	Payment made	0.50		195.00			195.00
12/15/20	Payment received		0.50	195.50			195.50
12/20/20	Payment made	0.50		195.00			195.00
12/25/20	Payment received		0.50	195.50			195.50
12/30/20	Payment made	0.50		195.00			195.00
12/31/20	Payment received		0.50	195.50			195.50

ALL DISCS SUPPLIED IN CARDBOARD BOXES WITH WHITE PROTECT TABS, LABELS AND ENVELOPES, AND COME WITH OUR NO-CURRLE PROTECT BACK-ON-REPLACEMENT GUARANTEE.

Also listed prices for silicon, tungsten, hafnium and various other conductors.

**CREDIT CARD HOT LINE**

(0256) 463507

NSV COMPUTER SERVICES LIMITED,  
23 HAMPSHIRE HOUSE, TOWN CENTRE,  
BASINGSTONE, HANTS RG21 1LG

HSV

# POOLSWINNER

THE UNIVERSITY OF CHICAGO PRESS

- **SHARPENED CLARITY** *Recommender's explanation* Says practitioners, "Ensemble simply uses our superhuman intuition - after looking at 10 years, the classifier system understands what the data is telling us."
- **POSSIBLE** *Ensemble (COMBINATION)* has GREATLY IMPROVED AND IS ACCURATE
- **RECOMMENDS** *Model* explaining that Ensemble performs better than any other model
- **ADAPTABILITY** *Practitioners* are given an easy design - "Others in their industry are not doing this. The [new] process provides a lot of data for the user - not just the [new] process, but also the data."
- **IMPROVED CLARITY** *All new users* are in the [new] process. Simply give the information to the user. The [new] process is a good [new] process. The [new] process is a good [new] process.
- **RECOMMENDS** *Model* explaining that Ensemble performs better than any other model

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

**Abstract**

© 1997 by J. B. Lippincott & Williams & Wilkins  
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without permission in writing from J. B. Lippincott & Williams & Wilkins.


COBOL

Microsoft's Windows 95 operating system is the most widely used desktop operating system in the world. It is a major step forward in the evolution of the personal computer. It is a major step forward in the evolution of the personal computer. It is a major step forward in the evolution of the personal computer.

...the ...

**PHOTO: 11-1-84** *at the author's residence for the 1983 National Merit Award*

Printed in the United States of America—except where noted. All rights reserved.



10 COUCHMAN LANE, CHICAGO, ILL. 60614  
 (312) 442-1100

**AT LAST . . . the magazine  
ST owners have  
been waiting for**

The magazine devoted exclusively to the Atari ST – ST graphics, ST music, ST programming, ST games and ST software.

In the pilot issue you'll find:  
Special features on ST flight simulators  
Introduction to programming the 68000  
Four word processors compared  
Six graphics packages reviewed  
N-n-n-nine of the very best games  
Dozens of music packages appraised  
Nearly 300 software packages detailed  
(No restriction in a year from last . . .)

© Emerald Group Publishing Limited, 2007

**Exclusive to readers of ST Update:** save £12 on the cost of Auroclay's excellent Detacom communications software and £5 on the price of Metacom's MCC Assembly.

**If you own an ST - If you're thinking about owning an ST - don't think about missing ST Update. ON SALE NOW!**





► continued from page 48

Impressive graphics in this multi-task beast which has you using various tools in order to become a Samurai Warrior. Three sections are Karate, Samura sword play and Karate. Looks good.



**Program** *Samurai Warrior* **Type** Arcade **Completion** Price £4.95 (also onto **Supplier** Playtex, Military House, Central Park, Aldershot, Beds RG7 4JN.

Budget disk software from Playtex - just under a fiver for two games. The two on the Commodore disc are *Psydo* and *Fungus*... neither state-of-the-art, but you might like to give it a try.

**Program** *Two Fungus* **Type** Arcade **Completion** Price £3.95 (also onto **Supplier** Doctor Soft Simulations, PO Box 66, Deer Park, West Sussex BN26 2TZ.

Simulation that lets you link two Commodores together - giving full two player with independent views of the action.

**Program** *Gemstone Healer* **Type** Role Playing **Academy** **Adventure** **Price** £14.95 (also onto **Supplier** US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7HX.



323 report that takes the role of Perry's type concept to the limit.

**Program** *Paul's Daring Day* **Type** *Adventure* **Price** £3.95 (also onto **Supplier** Autodesk Software, PO Box 100, 34-38 Crown Street, Heading, Berks.

Learning program based on the book, "Are you ready for your Daring Day?" by Mike Richardson - prepared to the best selling, "Then please start your engine and turn left at the lights."

**Program** *Rings of Zorro* **Type** Role Playing **Academy** **Adventure** **Price** £3.95 (also onto **Supplier** US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7HX.

Hope guided for mystic rings - looks like it has tremendous depth to it, but doesn't appear to be knocked out by the graphics.

**Program** *Shard of Spring* **Type** Role Playing **Academy** **Adventure** **Price** £3.95 (also onto **Supplier** US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7HX.

Party based interplay, with various bits, all involved in a shared quest.

All this ready arrived 323 staff don't feel, but it was generally agreed that the *Shard's* tale (Shard's Tale) is still the best 128K system on the 64.

**Program** *Just Computer Role Type* **Completion** **Price** £3.95 (also onto **Supplier** Data-Jolly, 25A Bell Street, Regent, Surrey W8 2JQ.

Heaven - it didn't know *Just Computer* was a bit.

**Program** *Angus Trapper* **Type** *Academy* **Price** £3.95 (also onto **Supplier** Playtex, 4 Little Dean Street, London WC2N 3LP.



The generic interplay teaches the Commodore 64 a bit.

**Program** *More Shards* **Type** *Academy* **Price** £3.95 (also onto **Supplier** Ocean Software, 4 Central Street, Manchester M2 5HD.

Comic conversion of a Nintendo

game of 1984 vintage. It involves platforms, and 16000. You break out the bullets, then kick them. *Crash* and *Fighter* *Plus* also make an appearance.

Oh, if you like that sort of thing

## PC and Compatibles

**Program** *The Fourth Protocol* **Type**



"They said it couldn't be done - but we did it." So said one Richard Kipp of Software Creations, one of the up and coming newer software outfits, with the broadcast of grin on his face. Richard is a happy man, and playing *Sentinel* on the Spectrum, you can see why.

The thing has been done by Software Creations as well as it possibly could have been on that format and has given thousands of Spectrum owners the chance to experience what the computer press in general have been raving about since last autumn, when the BBC version was released.

In case you missed any one of the several rave reviews in *Popular* (but, but, *Sentinel* is an abstract game of conflict set in a Marble Madness style environment - but instead of looking on from outside the landscape, you are dramatically placed right inside it. Your opponent is a figure placed on a plinth high above the stark surroundings - the sentinel.

The game is all about energy. Your ultimate task on each level (and there are 18,000, yes, ten thousand) is to destroy the sentinel by absorbing its energy. To do this, you must find a way to get higher than it. To do that, you have to create stacks of boulders (costing you two energy points each), then create a new robot "being" and transfer yourself into it.

Forever absorb your old self (gaining three), and look for trees to absorb (plus one) to replenish your energy supplies to make your next move. All the time this going on, the sentinel is slowly rotating like a deadly light-house, draining energy from you if you should fall within its gaze. Get the idea?

With a single sentinel, it's a stimulating exercise in these dimensional visualisations, when there are six - it's blind panic.

Of the four existing versions, Amstrad CPC is probably the best, but the more display on the Spectrum (and you can change that colour at will) is pleasing enough and well drawn.

In all, it's a great little implementation of Geoff Crammond's original - highly recommended for anyone that's finding the jumpy-jumpy, shooty-shooty a little bit tedious.

John Cook

continued on page 50 ►







# NEW RELEASES

— continued from page 51

who plan to dominate a nuclear device in standard format.

I bet it is a bomb - and will bombard with photo-balls for the next week. Catastrophic. It's addictive.

## Spectrum

**Program Army Moves Type Arcade**  
Price £7.95 **Supplier** Imagine Software, 6 Central Street, Manchester M2 9PQ.



**Program Chess Type Arcade**  
Adventure Price £1.95 **Supplier** Piccadilly Store, 74 New Oxford Street, London WC2.

3D perspective arcade adventure - not bad for under two quid.

**Program Pass Your Driving Test Type Application Price £7.95** **Supplier** Audioactive Software, PO Box 68, 34-38 Crown Street, Reading RG6.

See Commodore 64 listing for comment.

**Program Think Type Strategy**  
Price £1.95 **Supplier** Piccadilly Store, 74 New Oxford Street, London WC2.



Old Android? Well, if you haven't already got it, buy immediately. It's a very clever variant of Connect 4, and will stretch the brain without straining the pocket. Or.

**Program Tetris Type Strategy**  
Price £9.95 **Supplier** CDS, 14 Langton Way, Beckenham, London SE21 7TL.

Two battles from the American Civil War - Gettysburg and Chancellorsville. Uses the recently developed CDS Commodore system and features movement. What more do you want from a wargame?

**Program Red Squadron Type Arcade**  
Price £9.95 **Supplier** Quicksilver, Argus Press Collection, Victory House, Lutterworth Place, London WC2H 7PL.

Vector graphics shooter with a considerably higher hit rate. The Red Squadron is the code name for your MultiByte Infantry Combat Capsule - and as a Fourth Star Commando you have to take out the evil aliens, collect the goodies and buy fast food.

Looks OK - but the screen smother.

**Program Magic Brothers Type Arcade**  
Price £7.95 **Supplier** Dream Machine, 18 Central Street, Manchester M2 9PQ.



See Commodore listing for comment.

**Program World Games Type Sports Simulation** Price £9.95 **Supplier** US Gold, Units 2/5 Heddon Way, Wotton, Birmingham B81 1TX.

Eight sports to compete in around the world, with lots of local colour. Freightlifting in Russia, Sumo Wrestling in Japan, Curling in Mexico, etc.



**Program Fun (for Games) Type Completion** Price £9.95 **Supplier** Data-Jay, 258 Oak Street, Reno, Surrey RH9 7AD.

Includes Quasmod, Alan Page.

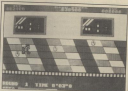
Wally and Gaudin at these very places 1986.

Quasmod was always a particular favourite of mine, written by Steve Turner - with a little inspiration from his partner in crime, and 64 programmer Andrew Braybrook. In fact, Quasmod is a 3D version of Pacemod, a supervising combination of arcade and strategy. Commodore?

**Program Fun Computer Mini Type Completion** Price £9.95 **Supplier** Data-Jay, 258 Oak Street, Surrey RH9 7AD.

An interesting mix on this one - a little of everything, including a little of the best of the best.

For Twenty sharp will return next week



**Metroid** is one of the recent arcade conversions of which I have not had the pleasure of playing the home original. This, at least, has the advantage that the game can be criticised in its own right rather than in terms of how well it has been converted. On these grounds, it's flat. At £24.95, though, the ST version is pricey.

Rather like Boulder or Trailblazer, Metroid is set in a surreal landscape of chess-board squares and heliportary hazards, and your task is to speed through the landscape without being obliterated. In this case the screen scrolls horizontally, your player is a little rather static, and there are twenty-four levels in complete.

Racing against a timer, you have to avoid hazards including pits, rolling boulders of Coke cans, giant washers, rotating cubes, rats which fasten themselves to your shoulders and have to be shaken off, green squares which slow down your progress, and exploding mantraps. To aid you there are skateboards which can increase your speed, trampolines which allow you to leap long distances (if your timing with the fire button is correct) and cans which can be kicked or jumped on to gain points or slow the timer.

Prober's conversion is colourful, fast, and very playable. Like many ST games, she scrolls across to flicker when there are a lot of animated objects on the screen, but it's nothing serious. Good use is made of the ST's graphics, though the sound and music are average.

Commodore 64, Spectrum and Amstrad versions forthcoming. It will be interesting to see how they measure up to the excellent ST version.



# Keep it simple

I was rather disappointed — to say the least — when I found that my copy of *Leather Goddesses of Frodo* didn't contain an inflatable doll (of the masculine kind, of course). It is the least one could expect from such a breed and fantastic game. Not even a whiff of leather pants!

Instead, I had to content myself with a pair of 3D glasses, a scratch n' sniff card and a 3D comic, which made my eyes go cross-eyed whether I was wearing the specs or not. As for the scratch n' sniff card I just made one foot nauseous. Such is life.

Though *Leather Goddesses* is typical of Infocom adventures, it also represents a distinct trend in computer games. No sooner do you open a computer games package these days than a miscellany of extraneous matter (the lops gamers would say "garbage") leaps out at you.

Somewhere beneath the capricious playguide, the non-on logs, the A3-sized poster, you eventually find the cassette or disc — yes, that's right, the reason you bought the package in the first place.

Wise betide you, however, if you're over foolish enough to expect everything to go back in the box just as you found it. The package designers, it's clear, go to amazing lengths to ensure that what they include in the package automatically expands on opening. Consequently, it's just about impossible to get everything back in.

Take *Don't Clough's Fantastic Fortunes*, for example. The board is a brilliant piece of lateral thinking. But after one has divined all the plays cards where the hell does one put them?

And if it's not exactly it's ridiculous, the latest from Pandemon, for example, is so loaded of New Random adventures are some of the best, but their novellas? Pass me the waste paper bin quickly.

What's even more infuriating is that you have to flip through these larded literary imposters just to get into the game. (Come back, Lancelot, all is forgiven.)

So the question that must be addressed to the computer games industry is this: Are all these extra bits and pieces really necessary?

The answer is bound to be ambivalent. In Hollywood ripoffs (one of Infocom's more recent adventures), for example, enclosed in the package is a letter from Jack Hobbards and a signed photo of the famous Buddy Burbank. But what one is supposed to do with the plastic tree that is also included — stick it in a cocktail?

Some would argue that such material helps to give credence to the fictional world of the game, and there's a certain amount to be said for that. Such material definitely helps some players feel that way into their assigned role. But without novelty or novelty would it not be possible to buy these already expensive games that much cheaper?

The fact is, whether *Leather Goddesses* contains a blow-up doll or not, it's the game itself that gives value for money and not all the accessories that come with it.

Julia Hunkleman



## Puzzle No 256

James was investigating the properties of "nearly equilateral triangles". A "nearly equilateral" triangle is one in which the sides, instead of being equal in length, differ by just one unit. In addition, he was only interested in those triangles that had an area of an exact number of square units.

The smallest such triangle, therefore, is one with sides of 3, 4, and 5 units, and an area of 6 square units. But surely, you will agree, is a triangle with such dimensions is nowhere near an equilateral triangle?

To this argument James would agree, but the next largest triangle in the series, and remember we are only interested in those triangles with areas of an exact number of square units, is one with sides of 13, 14, and 15 units. By the time we reach the third triangle in the series, having sides of 51, 52, and 53 units, only close measurement would differentiate it from a true equilateral triangle.

Can you determine the fourth triangle in this interesting series?

## Solution to Puzzle No 251

Jim was born in 1949, when Bill was 30 years of age. Bill's birth year was in 1919, when his father, Joe, was also 30. Therefore Joe was born in 1871.

Starting with the current year as Jim's year of birth, Bill's age is calculated using the long M. All possible ages are then subtracted from Jim's. Daniel has to find Bill's date of birth. This day is then noted in the solutions for primarily, if it passes this test, the procedure is repeated with all possible "squares" ages for Joe.

The first set of figures with all three prime and both difference squares are printed out.

## Winner of Puzzle 251

The winner's winner is Helen Trudy, of Chester, who will receive £10.

## Notes

The closing date for Puzzle 256 is May 28. Answers should include a program using a pointer.

1. 1919	2. 1949
3. 1979	4. 1989
5. 1999	6. 2009
7. 2019	8. 2029
9. 2039	10. 2049
11. 2059	12. 2069
13. 2079	14. 2089
15. 2099	16. 2109
17. 2119	18. 2129
19. 2139	20. 2149
21. 2159	22. 2169
23. 2179	24. 2189
25. 2199	26. 2209
27. 2219	28. 2229
29. 2239	30. 2249
31. 2259	32. 2269
33. 2279	34. 2289
35. 2299	36. 2309
37. 2319	38. 2329
39. 2339	40. 2349
41. 2359	42. 2369
43. 2379	44. 2389
45. 2399	46. 2409
47. 2419	48. 2429
49. 2439	50. 2449
51. 2459	52. 2469
53. 2479	54. 2489
55. 2499	56. 2509
57. 2519	58. 2529
59. 2539	60. 2549
61. 2559	62. 2569
63. 2579	64. 2589
65. 2599	66. 2609
67. 2619	68. 2629
69. 2639	70. 2649
71. 2659	72. 2669
73. 2679	74. 2689
75. 2699	76. 2709
77. 2719	78. 2729
79. 2739	80. 2749
81. 2759	82. 2769
83. 2779	84. 2789
85. 2799	86. 2809
87. 2819	88. 2829
89. 2839	90. 2849
91. 2859	92. 2869
93. 2879	94. 2889
95. 2899	96. 2909
97. 2919	98. 2929
99. 2939	100. 2949

## HACKERS

Overclassification: IBM's the secret success in today's white metal place.

And this is our first electric vehicle! Shell carry 6 people in comfort at 150 miles per hour!

Of course, the basic plan isn't new or anything.





Do you want your work published throughout the world by a company dedicated to creating imaginative software of the highest quality?

Palace offer generous advances and top royalty rates to talented and experienced programmers and designers with original ideas.

## PROGRAMMERS AND GAMES DESIGNERS REQUIRED



### Full-time Programmers

We will soon be starting new games as part of our continuing expansion programme and are looking for several new programmers to join our London-based team.

The people we are looking for will need to have some degree of programming experience on the Spectrum, Amibad or Commodore 64. Ideally you will already have completed at least one game, preferably arcade-style, but (at the very least) be able to demonstrate a degree of knowledge.

You will be working under the supervision of highly experienced games designers and alongside a talented artist and musician. Our offices are in Central London. Starting salary will be based on previous experience, and in addition royalties will be paid on sales of games. Applicants should be 20 years or above.

**If you are interested phone Pete Stone on 01-278 0751.**

### Freelance Commodore 64 Programmers

We need experienced C64 programmers to begin work immediately on projects which are now at the design stage. You will be helping talented artists and designers to make their ideas work and will need to have at least one completed arcade-style game under your belt.

We can offer you an attractive advance and a good royalty rate paid on sales of games.

**If you are interested phone Matthew Tims on 0632-813131**

### Designer/Programmer Teams

We are keen to publish the highest quality games produced by independent design/programmer teams.

If you have exciting and original ideas and the skill to see them through to a finished game, we would be very interested in talking to you.

**If you are interested phone Matthew Tims on 0632-813131**



**PALACE  
SOFTWARE**



# HYDROFOOL

"...Sweeping out the...  
The Weekend-Around Times

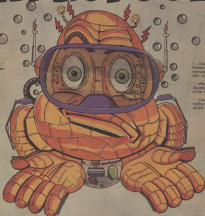
"...A game for the hard  
of hearing...  
Mammy Magazine

"...Whole Kipper...  
comes in this fast lane...  
Carroll's Own News

"...Save me a bad  
habits and make me a  
various ones...  
Mrs. Lightman

"...Very busy...  
Society for the Preservation  
of the Obsolete

"...Could have been the  
Yellow Wall...  
Archie House



*Featuring*

**HYDROMATION**

**SPECTRUM £7.95**

**AMSTRAD £8.95**

AVAILABLE MID-MAY

Fresh from his diabolical triumph on Knutz Folly, Sweevo is thrust onto the watery world of DEATHBOWL, a planet which, for no good reason, has been converted into a gigantic aquarium.

Will Sweevo succeed in his mysterious mission — or will the Great Bowl-Keeper pull the plug on him?

HYDROFOOL is a fast, 3-D, seek, chase, puzzle and laugh game, featuring the fabulous but irrelevant HYDROMATION.



